

HISTORY
OF THE
ROYAL SAPPERS AND MINERS,
FROM THE FORMATION OF THE CORPS IN MARCH 1772, TO THE DATE
WHEN ITS DESIGNATION WAS CHANGED TO THAT OF
ROYAL ENGINEERS,
IN OCTOBER 1856.

BY
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"Of most disastrous chance,
Of moving accidents by flood and field,
Of hour-breath scapes i' the tumult of deadly breach."—*Shakespeare*.
"There is a corps which is often about him unseen and unsuspected, and which is labouring
so hard for him in peace as others do in war."—*The Times*.

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HISTORY

OF THE

ROYAL SAPPERS AND MINERS.

1848.

Staff appointments—Survey of London—Colour-sergeant Smith—Sergeant Bay—Trigonometrical operations—Opposition to the military survey—Observatory above St. Paul's; the scaffolding—Privates Pemble and Porteous—Sergeant Steel—Industry and conduct of the Sappers in the Metropolitan survey—Preliminary arrangements of the Arctic expedition—Privates Waddell and Sulter—Corporal Mackie—Expedition starts; corporal McLaren—Coasting journeys and services—Overland march—Winter at Fort Confidence—Party detached to Great Bear Lake—Close of the search for Sir John Franklin and his crews.

SERGEANT-MAJOR JENKIN JONES was commissioned to be quartermaster to the corps on the 11th January, 1848, *vice* Hilton retired. These pages amply testify to the merits of Mr. Jones. A more indefatigable non-commissioned officer never served his country, nor one more worthy of the honours conferred upon him. Colour-sergeant Michael Bradford, a good soldier and foreman, succeeded him as sergeant-major at Woolwich.

With a view to establish a system for the sanitary improvement of the drainage of London, a survey of the metropolis, under the auspices of the Commissioners of Sewers, was commenced in January, 1848, and continued with a fluctuating detachment—once as many as forty-three strong, and as few as two men only—until January, 1850. Captain Yolland, R.E.,

had the direction of the work, and colour-sergeant Joseph Smith¹ was first appointed to the executive charge, but he being soon afterwards discharged, it then fell upon sergeant Andrew Ray,² sergeant Doherty, and others. With this survey was connected the determination of the relative levels of all parts of London.

¹ For some twenty years he was in charge of office and field parties on the detail survey and plan drawing. He had the local superintendence and direction, under Captain Williams, R. E., of the survey of the property belonging to the duchy of Lancaster at Llangainor, in South Wales, and of the Royal domain of Windsor Castle, under Major Tucker, R. E. His qualifications, as displayed in the direction of these surveys, led to his selection for the charge of the London survey, but his connection with it on the part of the Ordnance, was early broken, by his receiving, in July, 1848, the appointment of surveyor to the Metropolitan Commissioners of Sewers, at 200*l.* a-year, which salary has since been considerably increased. On leaving the corps he received a silver medal and gratuity for his long services and exemplary conduct. Ever since his discharge he has had the superintendence of a large staff of draughtsmen and men surveying underground in the sewers. In February, 1851, seven hundred miles of sewers had been thoroughly examined, and the levels of the different parts minutely ascertained. "The result of this," observed Sir Henry de la Beche, "is that they had documents connected with the condition of these seven hundred miles of sewerage, such as were not possessed by any metropolis in Europe. It was but justice," adds Sir Henry, "in referring to the work as examined, to call attention to the officer who had charge of it—Mr. Joseph Smith, who had executed his task with an ability, a zeal, and perseverance, deserving the highest eulogiums both of that court and the inhabitants of the whole metropolis."—"The Times," 1st February, 1851. Mr. Smith afterwards became conspicuous for his report condemning the construction of the Victoria Sewer, which was nullified by an entirely antagonistic report from Mr. Forster, the engineer, and gave rise to some little discussion in the House of Commons between Sir Benjamin Hall and Lord Ebrington.—"The Times," July 30, 1851.

² Remarkable for his great endurance of fatigue and exertion, and as being one of the best and quickest surveyors in the Ordnance. In his early career in Ireland, it is said, he once walked twenty-two miles to work, surveyed twelve miles of lines, and returned the same evening—twenty-two miles—to his quarters! This was considered at the time to be fair progress for six days; indeed, it was facetiously said of him that he carried on his work by *moonlight*. He was also clever as an observer with the two feet theodolite, and the accuracy of his arcs was so rigidly faithful, that an officer visited him specially to watch his work, and test the value of his services. More than twenty-one years he took part in the national surveys, and had the local superintendence for many years of large parties dispersed over extensive districts. He also assisted with much credit in the survey of the disputed territory in North America; and, receiving for his good conduct and long services a gratuity and silver medal, was discharged from the corps in January, 1851. Soon afterwards he emigrated to Canada.

The great triangulation was the first point attended to. "That wonderful specimen of skill, the scaffolding on and around the cross of St. Paul's, put up in the spring, was the main station for observations. The summits of Primrose and other hills, the towers," steeples, "and roofs of churches, the parapets or terraces of public buildings or houses," were made "available as the sites for signal-staffs, visible from each other and from St. Paul's."³ By these observations, "the relative angular positions" of the several points were obtained, from which, as the bases of the work, a detailed survey was made, embracing not only the principal streets and squares, but the minutiae of alleys and single buildings. Of every street the slope or ascent was ascertained, and also the exact height of every spot above the assumed datum or base-line.¹ The benchmarks to show the permanent points of the survey and levels were cut in stone, or on the most prominent objects, by the sappers, who, though not brought up to that work, became very expert in the use of the mallet and chisel. At least twelve parties with twelve-inch instruments were scattered to the most conspicuous places in the metropolis and its vicinage, to complete the observations; and sergeant James Donelan, with the great three-feet instrument, visited some of the old stations celebrated by the labours of General Roy and other officers, to check the smaller triangles formed by the operation of the twelve-inch instruments. Some of those stations were at Hanger's Hill near Twyford, Banstead Downs, Severndroog Castle on Shooter's Hill, &c. The survey, including the city, extended to a distance of eight miles in every direction from St. Paul's.²

London was unaccustomed to see soldiers employed in so important a work as the metropolitan survey, and much excitement was caused by their unobtrusive and peaceful operations. The jealousy of a class of surveyors was at once called into angry activity, and under the name of the "Associated Civil Surveyors," they formed themselves into a body, and opposed by meeting, petition, and remonstrance, the continuance of the

¹ 'Companion to Almanac,' 1849, p. 37

² *Ibid.*, p. 38

³ *Ibid.*

sappers on the duty.⁶ The Metropolitan Commissioners did the Association the honour calmly to investigate their grievance; but from the lucid and truthful statements of Mr. Edwin Chadwick and others, the continuance of the sappers on the duty was confirmed and justified, not only on the score of competency, but of policy, from the disciplined experience of the men, and the perfection of the Ordnance system of responsibility and resource.⁷

The particular objects which elicited from the public the most attention were the observatories on the summit of the north-west tower of Westminster Abbey, and above the cross of St. Paul's. The latter, from the dexterity with which the construction of the cradle at that dizzy height was pursued, supported only by the architectural ornaments of the structure, excited much curiosity and wonder. The scaffolding was of rough poles; the stage, ten feet square, formed of planks, which supported the observatory, rested on the golden gallery on the top of the great cone. "The four lower posts, twenty-nine feet long, stood upon short planks bedded on the stone footway; and the top supported the angles of four horizontal planks, each twenty-three feet long, bolted together at the angles. From these planks a screen of boards was erected to prevent materials, &c., from falling. The base of the four upper posts, fifty-three feet long, rested on the angles of the above planks; and the scaffold, in addition to these posts, consisted of four sets of horizontal and four sets of transverse, braces on each of the four sides, the whole being fastened together with spikes and ropes. Fifty-six of the uprights were double poles, placed base and point, and bound together with hoop iron and wedges, and with bolts and hoop iron at the splices. The height from base to floor was

⁶ 'The Observer,' April 9, and June 4, 1848; 'Civil Engineer and Architectural Journal,' and some of the London press.

⁷ The 'Times,' June 10, 1848. "The example of the employment of this corps," said Mr. Chadwick, "on beneficial public works, qualifying them for civil employment, was worthy of public note, for in their case, the discharge from the military service was not, as he had in Poor Law administration too frequent occasion to observe, the creation of paupers, or mendicants, or worse. There was no class of persons who so soon got into productive civil service."—*Ibid.*

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eighty-two feet, and to the extreme top of the observatory, ninety-two feet."⁸ A railing, roughly but securely put up, surrounded the "crow's-nest." "The ascent was by the inside of the tower or lantern to the circular openings, then to the outside of the foot-ladders set at the north-east corner, parallel to the north-east principal post inside the scaffold. The whole of the materials were drawn up from the floor by a permanent windlass erected in the tower, to the golden gallery, and thence passed to the outside, horizontally, through an aperture thirty-two inches wide, and finally were drawn up and put into position by purchase erected for the purpose."⁹ The whole construction weighed about five tons, and though designed by sergent James Steel, was erected by sergent James Beaton, the most successful builder of these aerial fabrics, assisted by privates Richard Pemble and John Porteous,¹⁰ and some civil labourers, under the direction of Captain Yolland.¹¹ The time occupied in going up the ladder was about seven minutes, but the descent required only four or five.¹² On the 2nd November the last piece of the scaffolding was removed and carted away. In the hazardous and intricate operations of building and dismantling it, not the slightest accident to human life or limb—not even the breaking of a single pane of glass—occurred.¹³

⁸ 'Illustrated London News,' June 24, 1848.

⁹ *Ibid.*

¹⁰ The privates here named have died under rather singular circumstances; Porteous *suddenly*, in September, 1853, when encamped on Brandon-hill; Pemble in June, 1854, at Elvanfoot, in Lanarkshire, from exhaustion and exposure to stormy weather. The latter had been sent from the camp to build a pile for trigonometrical purposes, and next evening, after a fatiguing day's work, he was returning to the station, when he lay down to rest himself by the side of a mountain stream, and perished. Both these soldiers were the chief practical workmen in the formation of the structures for the observatories. At lofty heights, where the senses of most men would paralyze, borne up on shaking props or slender supports, they calmly carried on their dangerous operations with spirit, activity, and ingenuity.

¹¹ 'Illust. Lond. News,' June 24, 1848; 'Historic Times,' January 19, 1849. In both of which are spirited cuts of the scaffolding, &c.

¹² The 'Times,' November 4, 1848.

¹³ *Ibid.* Here, however, it should be noted, that a pole about four feet long, on being let down into the boarded screen below, struck on a moulding and went down whirling. In its descent it struck the great dome, where it re-

The observations were taken by sergeant James Steel with an eighteen-inch theodolite, both at Westminster Abbey and St. Paul's. When not prevented by haze, the sergeant attended to his duty, frequently when the breeze shook his small location to a perilous degree, with a coolness, perseverance, and accuracy that were highly praiseworthy. Sometimes he and his assistant sapper—private John Wotherspoon¹⁴—ascended to the observatory at St. Paul's as often as three times a-day, and this carried through a period of four months—between the 17th June and 16th October—with unflinching resolution and assiduity, made the sergeant and the sappers objects of much interest and of curious and anxious inquiry. The observations taken from this height comprised between 8,000 and 10,000. In many instances the same subject was gone over as many as six times, none less than three or four, and the utmost distance obtained was twenty-six miles.¹⁵ The points thus trigonometrically fixed were 2,140, a vast number being church towers, spires, conspicuous public buildings, and manufactories.

To carry on the survey during the day in crowded streets, with an unbroken stream of vehicles in double transit, was an extremely difficult and irksome operation; but to be free as much as possible from this interruption, the sappers went to work every morning as soon as day broke, and pushed the survey while the metropolis was still at rest. The survey was completed in January, 1850, and the mapping finished at Southampton. For the merit and talent with which the work was conducted, the periodical press frequently expressed its admiration; and Sir Henry de la Beche and Mr. Edwin Chadwick—two of the Commissioners of the highest authority—

ceived a shell-like range, and dashed off, at a sharp angle, to the North Transept, where it made a hole through the lead of the roof, similar to what a ball of the same diameter would have done if let fall from the same height. In taking down the scaffolding, an eight-feet plank fell on its flat side from the lantern to the pavement in the area of the Cathedral, and the report was like the booming of a piece of ordnance from the deck of a ship of war.

¹⁴ Distinguished himself by his gallantry in the storming of the Redan on the 8th September, 1855.

¹⁵ The *'Times'* Nov. 4, 1848.

praised the survey as being one of extreme success.¹⁶ At another time the former gentleman observed at a special court of the Commissioners, that "the Ordnance undertook the work of the surface. A triangulation of no common order, but such as they might have expected from that distinguished service, was undertaken and executed; and upon that triangulation was founded a block plan of extreme efficiency and completeness; and it was also no common map, for it always had reference to that great triangulation to which he had already referred."¹⁷

The arctic expedition, which halted in October, 1847, for the winter, detached in the spring of 1848 a party of sappers to Cedar Lake to repair the boats, first cutting the wood for the purpose. When this preliminary service was accomplished, six of the party were selected to drag three planks each to Cedar Lake. Each man took with him ten days' provisions; but from the weary labour and fatigue of carrying such heavy burdens, and the snow-blindness that affected the men, the journey was not completed under sixteen days. The party consequently suffered great privation. After the boats were made thoroughly seaworthy, the sappers brought them and the stores up to Cumberland House on the first opening of the Saskatchewan.¹⁸

Privates James Waddell and John Sulter afterwards started from Cumberland House without a guide, considering the half-disclosed tracts of a previous party to be sufficient for their purpose. They were going to Cedar Lake. At Point Partridge, however, the snow having fallen heavily, the track was missed and they lost their way. For several days they continued to travel, and were wholly without food for more than seventy-two hours. Hunger pressed them to resort to expedients to mitigate their cravings. In this extremity Waddell, who had a spare pair of mocassins and a morsel of buffalo grease, consigned both to the canteen. When boiled, the old boots were speedily devoured, and the soup equally divided

¹⁶ 'Builder,' 7th April, 1849, p. 165.

¹⁷ The 'Times,' February 1, 1851.

¹⁸ Sir John Richardson's 'Boat Voyage,' 1, p. 53.

among the famished adventurers, formed a novel but refreshing repast. Onwards the party went, winding through the woods and trending through the deep snow, when after a journey of about four miles they gained an Indian encampment, where the natives provided them with musk-rats to eat, and one of their number guided them to the lake.

It is right also to record another little adventure in which lance-corporal Robert Mackie was the actor. He strayed in the winter on Cedar Lake. Overpowered by exertion and weariness he laid down on his planks and fell asleep. When he awoke two of his toes were frozen. Nothing dismayed by this untoward affliction, he started off to seek a retreat from his difficulties. A native sent to search for him, found the wanderer "contentedly steering for the moon, which being near the horizon and gleaming red through the forest, was mistaken by him for the fire of the men's bivouac. The snow which covered the ground at the time fortunately enabled the Indian who went in pursuit of him to trace his steps before he had gone many miles."¹⁰

Reinforced by the party from Cedar Lake, the expedition started in May, 1848, from Cumberland House, with boats fully laden, leaving two sappers behind "who were unequal to the labours of the voyage." One had received an injury in the hand by which he lost a joint of one of his fingers, and the other suffered from scurvy and pains in the bones. Both were sent to England by the first conveyance after their arrival at York Factory; and the expedition thus lost the services of second-corporal James McLaren, a man of enlarged intelligence and experience, and active zeal.

Very prosperously the expedition now moved on, crossing rivers, lakes, and streams, pulling the boats over difficult and rugged portages, and bearing heavy burdens. For three days they were delayed by ice in Beaver Lake, and then pressing on anew, tracked the course to Methy Lake, where on the 27th June, Sir John Richardson reached his men. They had encamped at the landing-place the previous day, and were

¹⁰ Sir John Richardson, II, p. 141.

advanced one stage of different lengths according to the physical capabilities of the respective individuals. "On visiting the men, Sir John found two of the sappers lame from the fatigue of crossing the numerous carrying places on Churchill River, and unfit for any labour on the long Methy portage."²⁰

The baggage, which it was indispensable to carry with the expedition, was equally distributed, which gave to each man a burden of 450lbs., exclusive of his clothing and bedding, all of which he shouldered over the portages in three or more trips according to the measure of his strength. This was an enormous load, and was borne day after day under constantly-varying circumstances of trial and fatigue. The boats with their masts, sails, anchors, &c., were also carried by the whole party at every portage.²¹

"On the 3rd July the baggage and the boats were brought to the banks of the Little Lake; and on the 6th, everything having been taken over to Clear-water River, the expedition descended from the Cockscornb, where they had been encamped for two days," and in nine days more completed the laborious passage of the Methy portage. "The transport of the four boats was made on the men's shoulders, and occupied two days and a half."²²

On the 7th two of the boats were broken in crossing the portage of the woods, but, being repaired with some dexterity by the sappers, they were ready for proceeding the following morning. Athabasca Lake was entered on the 11th July, but two of the boats taking a more easterly branch of the river in the night, delayed the arrival at Fort Chipewyan. In the misguided craft were the chief artificers of the sappers, and the accident prevented the boats being completely repaired and furnished with false keels, to contend with the difficulties inseparable from adventure. All leaks, however, were stopped, and some damaged planks replaced, which enabled the party to start again on the 12th July.²³

Many days were now spent in effecting the clearance of

²⁰ Sir John Richardson, i., p. 110.

²¹ Ibid., i., pp. 110, 111.

²² Ibid., i., p. 115.

²³ Ibid., pp. 119-131.

numerous portages over broken and rocky prominences, and driving on through narrow and tortuous channels made picturesque by the presence of frosted cascades, dashing over ledges, or rushing past blocks of trees and drift timber—the accumulation of ages. A boat was upset in one of the portages by lowering it down a narrow channel, when several articles of marine importance were lost or damaged, among which were the indispensable oars, which, however, were soon replaced by the assiduity of the sappers. Fort Resolution was gained on the 17th July, from which, by rapid marches, laboured boat journeys, and toilsome industry, they made, on the 24th, the first range of the Rocky Mountains. Hurried stages, through intricate courses and over rocky chasms, with gales blowing and heavy rains falling, brought them on the 2nd August to Point Encounter, where they encamped for the night; and on the 3rd they reached the estuary of the Mackenzie River, where a horde of Esquimaux visited the boats. The interview on the part of the natives was characterised by a spirit of intrigue and hostility, but terminated without serious consequences; and, striking out from the shore, the boats pushed on to Copland Hutcheson Inlet, Cape Bathurst, Point Deas Thomson, and Cape Young, where the expedition went ashore to repair the boats, which had been rendered unseaworthy by the ice tearing the planks into leaks. The damage was repaired by the sappers in the evening.

Near Point Cockburn, on the 22nd August, a storm overtook the party. The sky was dark and lowering, heavy showers fell, and a waterspout was seen on shore. Sir John Richardson thus alludes to it. "Ice-floes lying close off Cape Hope caused us no little trouble, the passages among them being very intricate, and the perpendicular walls of the masses being too high to allow of landing or seeing over them. In the afternoon we passed Cape Bexley, running before a stiff breeze, and at 5 P.M. a storm suddenly coming on we were compelled to reduce our canvas to the goosewing of the mainsail, under which we scudded for an hour, and then entering among large masses of ice, about two miles from Point Cockburn, found shelter under some pieces that had grounded." To encamp was impracticable, for the

shore was flat, and they passed a bitter night in the open boats. "The ice-cold sea-water chilled the men as they waded to and fro;" and, as the wind was too strong to admit of the employment of any expedient to shelter or warm them, no protection could be afforded against the biting bleakness of the storm.²⁴

On the 26th August the expedition was at Lambert Island. A frosty night covered the sea and ponds with young ice, and glued all the floes immoveably together so that the rise of the tide was no longer of service. "Assisted by the seamen, the sappers launched the boats and carried the cargo ashore, devoting the greater part of the day to the operation of cutting through tongues of ice, dragging the boats over the floes, moving large stones" that intersected the route, and resorting to every conceivable expedient to make progress. Two more rugged portages were also crossed; and in that day of severe toil and unremitted zeal a journey of five miles only was accomplished. Heavy snow-storms now succeeded, the cold became intense, and the surface of the pools of sea-water was converted into a consistency like paste, which demanded great physical exertion in pushing on the boats. On the 28th, three hours were spent in moving forward an inconsiderable distance—about one hundred yards—owing to the benumbing coldness paralysing the physical energies of the men.²⁵

With little incentive to spirit and none to amusement, save what the incidents of arctic travel were calculated to produce, the men relaxed no effort, and avoided no danger, in their endeavour to achieve the great purpose of the enterprise. Against obstacles both by land and sea, from wind and storm, they bore an undismayed front, and, driving on day by day, they gained Basil Hall Bay, and encamped about eight miles from Cape Kendall. In dragging the boats over the floes in these parts they were greatly shattered, the planks being torn and broken, although they had been strengthened by the sappers "on the water-line with sheets of tin beat out from the pemican cases."²⁶

²⁴ Sir John Richardson, i., p. 289.

²⁵ *Ibid.*, i., p. 294.

²⁶ *Ibid.*, p. 299.

Here terminated the coasting voyage, some distance from the Coppermine River, on account of the ice having, from the severity of the weather, become too thick and firm to admit the continuance of the ascent, without jeopardising the safety of the expedition, in the few frail boats employed in their along-shore adventures. An overland journey in quest of Sir John Franklin and his missing crews was therefore decided upon, and arrangements for the march were at once entered into. Thirteen days' provisions were packed up for the party, with cooking utensils, bedding, snow-shoes, fowling-pieces, a portable boat, &c. The burdens were apportioned by lot, each load weighing about 70lbs.²⁷ The boats, tents, stores, &c., that could not be taken on were abandoned on the coast: and on the 3rd September, after breakfast, prayers being read to propitiate guidance and protection from a gracious Providence, the march commenced. With few exceptions, the men trudged on with so indifferent a pace, that to keep up they lightened their loads by leaving their carbines behind. About seven-miles from Cape Kendall a halt was made, and the men slept at night in the cold air, under the miserable shelter of some towering blocks of basalt 200 feet high. Private Donald Fraser this day sprained his knee, and on the next he was so unfit for his task that his burden was eased by throwing away his large hatchet, and distributing, for carriage, a portion of his pemican among the other travellers. Several of the men straggled and made but slow progress. Rae's and Richardson's Rivers being crossed—the latter by a portable boat fastened to a hawser—the expedition reached, on the 5th September, the Coppermine River and bivouacked about three miles above a dreary spot bearing the tragic designation of the Bloody Fall.²⁸

On the 6th the weather was clear, with a hard frost, but the sun, which had been a stranger for more than a fortnight, now shone brilliantly. Generally the party walked briskly, protected in some degree from frostbite by an addition to their cumbersome apparel of warm seal-skin boots; “but three of the seamen and two of the sappers and miners were so lame it was necessary to

²⁷ Sir John Richardson, p. 308.

²⁸ *Ibid.*, i., pp. 309-318.

make long and frequent halts to allow them to close in;" so much so, that they "were unable to accomplish two geographical miles in the hour." To give respite to their sufferings and time to gather strength, a camp was formed which greatly refreshed them; and next day they resumed the march in the face of a snow-storm, heightened by a piercing northerly wind.²⁹ Two rapid torrents, full of boulders, were forded in the course of the day's journey, and "the discomfort of the march was greatly augmented by the men's clothes, which had been saturated in crossing the streams, freezing on their backs." In the vicinity of some narrow lakes by the side of a cluster of low, naked, but wide spreading spruce trees the expedition encamped, and here, as in other places, they arranged a "bivouac by placing small branches between the frozen ground and their blankets." The following day found them resting near the Copper Mountains, crossing which, they walked onwards in snow-shoes, not without much difficulty and fatigue; and those of the travellers who lagged were assisted on their way by easing them "of everything but their blankets, spare clothing, and a few pounds of pemican."³⁰

The Kendall River was crossed on the 11th by a raft made on the spot of dry timber assisted by the sappers. It supported in its transit three at a time. A fresh disposition of the burdens was made here, and the carriage of some books and dried plants relinquished. The log raft was also broken up to recover the cordage by which the timbers were lashed together. This done the course of the party was shaped across the country for Dease's River. They started in a fog, which became denser as they proceeded, so that at length an object three yards in advance could not be seen. The compass was necessarily used to steer by; all wended onwards in Indian file, and though the pace was brisk none fell back. The lakes which barred their way had a dreary aspect, for they were not seen until the travellers "came suddenly to the brink of the rocks which bounded them, when the contrast of the dark surface of their waters with the unbroken snow of their borders, combined with

²⁹ Sir John Richardson, i., p. 321.

³⁰ Ibid., p. 326.

the loss of all definite outline in the fog, caused them to resemble hideous pits sinking to an unknown depth." The intersection of their track by these lakes was very hazardous, and it was a wonder none of the straggling explorers fell into the abysses and met their fate. At night they spread their blankets on an isolated rock, and without supper, or the cheering gleams of a fire to give solace to their spirits, sought to snatch some repose. Snow fell on their exposed bodies as they lay. Many groaned bitterly with pain, and but few could sleep. Next morning, however, all were early afoot, and before the day fairly opened, they had marched three hours, and forded, up to their waists, a tributary of the Kendall, by which they "were all more or less benumbed."³¹

In a country like the arctic region much is uncertain, and extremes may be experienced with almost incredible rapidity. Here a supperless night was succeeded by one which gave a sumptuous meal of venison, and a sound night's rest in a snug encampment. With light loads, full stomachs, and a long halt in prospect, the spirits of the party received a barometrical rise that indicated alike their satisfaction and cheerfulness. Hill after hill they mounted; and traversed, with unusual alacrity and ardour, stretches of undulated country. Now they were wading through a swamp, now trending a rough hummocky tract of land, now scaling a difficult height, and then forcing across an expanse of deep snow. The journey was trying and harassing, and each night, the party, jaded, lame and footsore, sought repose in open bivouac; but on the morning of the 15th of September, after fording the Dease, the travellers arrived at Fort Confidence—the haven appointed to recruit their wasted energies, and to shelter them from the storms and tempests of the coming winter. The overland journey had occupied thirteen days.

Three days subsequently, Sir John Richardson, finding he could dispense with the services of eighteen persons, sent them on to the fishery location of Big Island on Great Slave Lake. Ten of the detached party were sappers, leaving only three of

³¹ Sir John Richardson, i., p. 331.

the corps with the chief, viz: lance-corporals James Mitchell and Robert Mackie, and private David Brodie. The two latter fitted up the meagre establishment with tables and chairs, and such other social commodities as were considered to be requisite to give the fort a character of domestication, and to afford facilities of comfort to the adventurers. The fort was about three miles from the mouth of the Dease River and near to Fishery Island.

As far as the European contingent was concerned, the expedition was brought to a close; and the search, prosecuted under very trying circumstances, amid perils, hardships, and want, failed to discover any trace of the whereabouts of Sir John Franklin and his crews. The shores of Wollaston and Victoria could not be examined as had originally been intended, as Sir John Richardson had no means of carrying out the project, his craft having, unavoidably, been abandoned in September, 1848. With the only boat, however, taken up to Fort Confidence, Mr. Rae, with a party of natives, essayed unsuccessfully to pass to Wollaston land. Had this been achieved, a defined clue, in all probability, would have been presented to the track of the missing adventurers. It was in the vicinity of this region, a few years after, that the mournful relics of the fated explorers, found by some Esquimaux, passed into the possession of Mr. Rae, and confirmed in this country the certainty of the appalling destiny of the expedition.

1848.

Augmentation to corps—A calculating prodigy—Company removed from Portsmouth to Ireland—Chartist demonstration and services of the sappers in London—Road-making in Zetland—Company to the Mauritius—Major Sandham—Sergeant Anderson—Sergeant Ross—Sir Harry Smith's frontier tour at the Cape—Passage of the Mooi; corporal Pringle—Passage of the Konap; sergeant McLeod; also of the Orange River—Boem Plantz—Spirited conduct of a party in removing an ammunition tumbril, which had upset in some burning grass—Peace—Inspection at Gibraltar by Sir Robert Wilson—Also at Hong-Kong by Major-General Stavelay—Company at Corfu—Return of party to England from the Falkland Islands—Sergeant Hearnden.

THE nineteenth company was formed on the 1st of April and appropriated for the duties of the survey.¹ On the 1st of September, another company, numbered the 20th, was organized, which increased the establishment from 1,800 to 2,000 of all ranks. The detachment of one sergeant, one corporal

¹ This year was enlisted a calculating youth named Alexander Gwin, a native of Londonderry, who had a brother and an uncle in the corps. When only eight years of age, he had "committed to memory the logarithms of all the natural numbers from one to a thousand." Two years later, his fame having spread, his precocity was tested at Limerick "in the presence of Colonel Colby, Lord Adair, and several other gentlemen of distinction," to whom he repeated the whole series, without a mistake, taking up two hours and a half to deliver himself of that gigantic mental effort! "His rapidity and correctness in calculating trigonometrical distances, triangles, &c." were equally remarkable. "In less than one minute, he could make a return in acres, roods, perches, &c., of any quantity of land, by giving him the surveyor's chained distances; while," it is added, "the greatest mathematician with all his knowledge would certainly take nearly an hour to do the same, and not be sure of truth in the end."—'Year-Book of Facts,' 1842, 'Boys' Own Book,' p. 381, published by Bogue. This calculating boy, making allowance for the hyperbole of his admirers, was without doubt a youthful prodigy. He is now a corporal on the survey, useful and energetic in his duties; but as the opportunities for improving his faculty for figures have been considerably lessened by the nature of his employments, he has not become what his infantine capabilities promised—another Bidder.

and twelve privates, formed by royal warrant in July, 1839, for service in South Australia, merged into the establishment in December, by an order dated 15th of that month, and thus reduced the corps from 2,000 to 1,985 of all ranks. This measure was effected to simplify details and to make the detachment form part of a company, without removing it from the province. Its expense still continued to be borne by the colonial government.

The company at Portsmouth, ninety-eight strong, under Captain Robertson, R.E., was sent by rapid conveyances to Dublin, and arrived there on the 2nd of April, to assist in quelling the rebellion in Ireland. Late in July, Lieutenant Akers, R.E., with one sergeant and fifteen rank and file, accompanied the troops under the command of Major-General Macdonald to Thurles, and encamped about a mile from the town, and returned to Dublin in September, without any necessity for their services arising. The meditated revolt was crushed, and Smith O'Brien with some other demagogues, convicted of traitorous designs, were expatriated. The company on being withdrawn from Ireland, removed to Woolwich, where it arrived on the 19th of February, 1849.

A rising of the Chartists being anticipated, measures were taken to thwart their designs. Troops were collected with rapidity from all quarters and appointed to various posts in London, to act if occasion required. Late in the evening of Saturday the 8th of April, a company of 100 strong with sergeant-major Bradford, under the command of Captain Tylee, R.E., was detached from Woolwich to the Tower of London. Each man took with him forty rounds of ammunition. The company slept in the Tower that night, but early next morning, two sergeants and thirty-two rank and file, under Lieutenant Sedley, R.E., were sent to the Ordnance Office, Pall Mall, to oppose any attempt at possession by the Chartists. Another party with sergeant-major Bradford under Lieutenant Wilkinson, R.E., was removed to the Bank of England. On the roof of this edifice were built platforms; and at certain places, massive timbers with loop-holes were run up as positions

for defence. Several thousand sand-bags filled the upper tier of windows facing the Royal Exchange, and others as high as a man were piled upon the parapet of the roof, with apertures between them for musketry. Over the entrance of the building, a strong wooden machicouli, resting upon ponderous beams, projected into the street, which held a party of the corps ready to open a volley on the rabble, had an attempt been made to force an entrance. In the yard leading to the workshops, &c., the sappers also erected an enormous barricade of casks, hand-carts, &c.

The detachment at the Tower was no less zealous. At the Byward tower, the face—overlooking the entrance to the fortress from the Thames by the bridge—was loop-holed, as also a building to command the other entrance. About thirty yards inside—from the gate of the Byward tower—a strong intrenched stockade was erected; and on the wharf near the Traitor's tower, two barricades were constructed of crates with bricks in them, iron coal boxes, &c., which were loop-holed for musketry. Along the Traitor's wall was an erection of sand-bags with openings for firing, and on the roof of the barracks, banquettes, to enable the troops to play on the mob in the rear near to the Mint, were formed of scaffolding and military forms. The old bricked-up embrasures facing Tower Hill were also rendered ready for the reception of guns by picking out the bricks and clearing away the debris, which for years had been accumulating there. Fortunately no outbreak occurred, and the company returned to Woolwich on the 14th of April.

There happened at the time to be a handful of the corps in London employed in the metropolitan survey, who, as the occasion was ominous and pressing, were relieved from their professional operations to assist in those of defence. So well did they discharge the duties intrusted to them in barricading the entrances to the high offices of the State, that their conduct was acknowledged in a communication from Lieut.-Colonel Alderson of the engineers in these terms. "I have been requested by Mr. Trevelyan, on the part of the Chancellor of the Exchequer and other authorities of the government, to express

their satisfaction at the good conduct of the detachment of royal sappers and miners, under the command of colour-sergeant Smith, during their employment under me at the Treasury and government-offices on Sunday, Monday and Tuesday last; also in the efficient professional aid they afforded, in putting the Treasury-buildings and Downing-street in a state of defence."

In May, Captain Webb, R.E., with one sergeant and one private, both surveyors, proceeded to Zetland by an order from the Commissioners of the Treasury, and laid out and surveyed nearly ninety miles of road, upon which the poor of the islands were employed to afford them relief. In September, the party returned to Woolwich, where Captain Webb and the sergeant completed the plans of the work for the Home Office. The conduct and zeal of sergeant R. Forsyth were specially brought to the notice of the Treasury, and in a letter from Sir Charles Trevelyan to Captain Webb, dated 26th of December, 1848, it is stated, "that my lords have received with satisfaction your report of the zeal and intelligence displayed by sergeant Forsyth in assisting in this service; and that if his exertions shall continue to be equally useful, they will be prepared to grant him some moderate additional remuneration when these operations have been brought to a close."*

A new station was opened for the corps this year, by detaching to the Mauritius a company of 100 strong, under the command of Captain J. Fenwick, R.E., which embarked at Gravesend on the 2nd of May, and landed from the 'Edmundsbury' on the 19th of August. A half company had previously been employed there, but on the completion of the citadel in 1840, it was removed to the Cape of Good Hope.

Captain John Walpole, R.E., was commissioned as brigademajor to the corps on the 1st of June, 1848, *vice* Major Sandham removed to the ordnance office as second inspector-general. With the sappers, Major Sandham had served for

* He never received any additional remuneration at the close of the work, but his high rate of working-pay may have been considered a sufficient equivalent for his services.

many years, and the great interest he took in their concerns is well known. Strict impartiality and a penetrating discrimination marked his whole conduct; and his attention to the discipline and drill, raised the character of the corps for military appearance and efficiency. The ready testimony of Lord Bloomfield, the commandant of Woolwich garrison, was frequently awarded to Major Sandham for his success in these particulars, and never was the corps present at a garrison parade, but his lordship called the attention of his staff to its correct marching and manœuvring. A sterling friend to the sappers, Major Sandham, with hearty goodwill, provided many non-commissioned officers and men with comfortable and lucrative situations in civil life, although in doing so, he laid himself under many and deep obligations to those from whom he obtained the patronage.³

³ Sergeant James Anderson was one of those who was thus favoured. On obtaining his discharge, with a pension of 1s. 10d. a day, in August, 1845, he received an appointment in Worsley-yard, belonging to the estate of Lord Ellesmere, as superintendent and storekeeper of the yard, at a salary of 120l. a-year, with a residence. Since then, such has been his scrupulous character for honesty and careful supervision, that a very handsome addition has been made to his income, and the utmost confidence is reposed in him.

Another was colour-sergeant John Ross, a very ingenious mechanic, who after his discharge, in April, 1848, was appointed engineer at Runcorn, to attend to a small steam fleet in the canal, under the Bridgewater Trust. He invented the drawbridge at the entrance of Fort Albert, Bermuda, the largest of its class in any military fortification, and which can be easily worked by two men, either in throwing it across the ditch, or pulling it in. Many years of his life had been spent in perfecting a new system of locomotion for ships. His great idea was the construction of a vessel which should ride above the control of the waves, resting upon an arrangement of large cylinders, to serve, like the piers of a bridge, as the natural supports of the ship, and within which should be placed his revolving paddle wheels, to be moved by steam appliances. By a very ingenious contrivance he provided that the sea, which should come in contact with the paddles, should not only be deprived of its resistance, but made to assist in the propulsion of the vessel. The speed he calculated to obtain by his system was almost incredible. Personal trials of an imperfect model, in the waters at Bermuda, convinced him of the practicability of his bold scheme. After quitting Runcorn, ambitious of higher employment, he emigrated to Canada, where he is pursuing the study and development of his novel notions of shipbuilding and locomotion. He received a gratuity and medal for his services in the corps, and might have been promoted to the rank of sergeant-major, but, restless and speculative, he preferred to try what his mechanical genius would yield him in civil life.

At the Cape of Good Hope, the companies were still dispersed to about fifteen stations on the eastern frontier and at Pieter Maritzburg. In February, corporal George Pringle, having under him twelve men of the 45th regiment, threw a raft of casks for the passage of his Excellency Sir Harry Smith and his guard, over the rivers Umgani, Mooi, Bushman's, and the two Tugelas. Sir Harry was taking a peaceful tour of the colony from the frontier to Natal, during which he inquired into the disaffection of the Boers, and settled matters with Pretorius relative to the sovereignty of some territory north of the Orange river, and eastward as far as the Draakenberg mountains.⁴ Corporal George Pringle and party, under Lieutenant Gibb, R.E., went from Pieter Maritzburg to the foot of the Draakenberg range, about 120 miles, to meet him. His Excellency noticed corporal Pringle for the activity and intelligence he displayed on this service. When crossing the Mooi, in consequence of the strain on the hawser which had been previously fastened to the opposite bank, the raft capsized, and threw the pontoon party and fifteen men of the Cape mounted rifles into the stream. Corporal Pringle and a man of the 45th regiment, alone clung to the raft; and as it swept along with the rapid current, whirling round and round with the eddy, the corporal dexterously seized the end of a breast-line, jumped into the stream, and swimming to the shore, moored the raft to a clump of bush, by which it swung in safety. All the saddles and carbines, the waggon, and Sir Harry Smith's horse, which were on the pontoon at the time, were thrown into the river. The horse, by means of a lasso, was soon rescued; and the waggon, about five feet under water, was recovered by the coolness of the corporal, who swam to the spot, and lashing it to the boom, hauled it, with the assistance of his party, to the bank. All the soldiers were saved. The corporal now adopted another method to take his Excellency and the guard across, and the passage of the Mooi, more than fifty yards wide, was eventually effected without accident to the troops or injury to the baggage.

⁴ 'Cape and the Kaffirs,' by Mrs. Captain Ward. Bohn's edit. 1851, p. 230.

Six privates, under sergeant Alexander M. M'Leod, left King William's Town on the 2nd August with a division commanded by Sir Harry Smith, to chastise the rebel Boers at Boem Plaatz. On nearing the Konap, the party was sent in advance to discover the ford. All night was spent in the tedious search, but by daylight next morning it was effectually traced and the march across the Konap commenced. The train, however, was soon stopped in its progress, as the leading waggon, unskilfully conducted by the vorlooper in charge of it, got off a ledge of rock upon which it was proceeding safely, and sinking into the water, the gunpowder it contained was destroyed. At the same time the vorlooper, young and weak, unable to stand against the current, was swept off his legs. In this emergency Colonel Buller directed the sergeant to assist the train in crossing. Standing in the centre of the stream, he controlled the refractory oxen and drove them to the opposite shore. There, however, fresh difficulties arose, for, as the soil was greasy and the bank steep, the oxen could not draw the waggons out of the river. Instantly the party of sappers reduced the bank, and throwing the excavated earth on the slippery beach, the waggons were at length dragged to the shore.

Arriving at the Great Fish River, the troops, guns, and baggage were ferried across on the India-rubber raft taken with the sappers, while the empty waggons were drawn over by means of a hawser. On the 20th the Orange River was reached; next day four other sappers were added to the party, and on the 22nd, at day-light, the India-rubber float was launched for the passage of the division. The river was 250 yards wide and a very rapid tide was running, when, having stretched a sheer line across the stream fastened on either shore to a tree, the operation was successfully carried out. Forty men were ferried across at a time, the expedient of the guiding hawser considerably lessening the labours of the party. Three guns and several waggons were also taken over. The latter were simply rolled on the raft without disturbing their loads, and were deprived of any dangerous motion by blocking

their wheels. Not a single accident occurred; and in compliment to the unfailing zeal and efficiency of the men, Sir Harry Smith took occasion, on a general parade at Graham's Town in October, 1848, to acknowledge that to the royal sappers and miners he was "greatly indebted for the means with which he had been enabled to make the passage of the Orange River, many of the men swimming in the river like dolphins in getting across the baggage and material." ^b

Marching for Boem Plaatz the detachment was present in an engagement with the Boers, remaining for a time in the rear in charge of ten ammunition tumbrils, and four engineer waggons, containing engineer tools and stores; but ordered to the front by the Governor's aide-de-camp, Captain Holdich, they pressed forward with four ammunition waggons, and did good service, during the remainder of the action, by serving out the cartridges to the troops.

It was not long before the Boers were beaten, and the column advanced, followed by the sappers and the train of waggons. The grass was on fire on either side of the road. Just at this time the fore-skein or lynch-pin of the leading waggon broke, the near fore-wheel came off, and the tumbril upset. Another minute and the burning grass would have blown it up; but there were resolute spirits in the party, who, undaunted by the danger, rushed to the spot, raised the dismembered waggon from the fire, and replacing the wheel, fastened it by the drag-chain through the spokes to the tessel-boom. The expedient answered its purpose for twelve miles, when, by Sir Harry Smith's orders, the ammunition was removed to a commissariat waggon.

On the 30th August, at Bloem Fontein, the Sovereignty was proclaimed to be British territory. A few days after, marching for Wynberg, the sappers cut a road up the steep and rugged banks of the river they crossed on the route, and repaired a drift for the waggons at Wynberg. There a review was held by Sir Harry Smith. Moshea, the paramount chief of the Sovereignty, and his sons were present, attended by a

^b 'Gr' 's Town Journal,' October 14, 1848

cortege of 800 armed horsemen clothed in European garb, and 1,500 foot warriors in their war costume and accoutrements. When the display terminated, the Kaffirs formed a circle round Sir Harry Smith and the chief Moshes, and performed a frantic war-dance to serve as an additional proof of the re-establishment of peace. The sappers with the other troops witnessed this barbaric demonstration, and afterwards returned to Bloem Fontein.

The companies at Gibraltar, brought to a strength of 197 men by the arrival of a reinforcement of 53 rank and file, were inspected by the Governor, Sir Robert Wilson, in May, and his report complimented them on their efficiency, zeal, and capacity. "Under arms," Sir Robert added, "their appearance is soldier-like, and their exercises were creditably performed." His Excellency, however, had to regret "that the vice of drunkenness should exist in a corps otherwise so respectable."

In October, Major-General Stavelay inspected the half company at Hong Kong, but while he commended the men for their "fine looks" and "being well dressed," he censured the irregularity which had recently marked their conduct. Intoxication, the greatest bane of the colony, was the chief predisposing cause of disease; and the sappers, who from the nature of their service were continually employed and often much exposed to the sun, carried the propensity to an extent which produced much sickness, and justly called for the Major-General's animadversion.

Very different, however, was the conduct of the seventh company at Corfu, which, having completed its tour of foreign duty, was relieved early in the year and returned to Woolwich. The Lieutenant-General spoke of their constant good conduct and exertions during the period they had been under his command, and commended them for the excellency of their services. In parting with the company he expressed his good wishes for their welfare, and a vast concourse of the inhabitants cheered them through the streets to the point of embarkation. Since 1824, the companies successively sent to Corfu were chiefly

employed in the works of the citadel, and the defences of Vido. Fort Neuf and the church in the citadel, as well as Fort George, Lunette Wellington, and the Maitland Tower at Vido, attest the skilful workmanship of the sappers. Individuals or small parties were at different times detached on particular duty to Santa Maura, Zante, Paxo, and Cephalonia. Of this special duty some idea may be formed, from the nature of the employment of a corporal, who being sent to Santa Maura in December, 1845, by order of the Lord High Commissioner, superintended the workmen engaged in opening a new channel into the port, to render the inner passage once more practicable for ships sailing either up or down the coast.

The detachment at the Falkland Islands was removed from that settlement on the recall of Governor (Captain Moody, and lauded at Woolwich the 29th November, 1848. For more than six years the party had discharged all the duties of soldiers and artificers, assisted by about forty civilians chiefly labourers; and in that short period a considerable improvement had been made in the colony. Several buildings had been erected, including the Government-house and offices; also a school-house and barracks, and cottages for emigrants and workmen, with houses for boats and stores. Jetties were also constructed, sea-walls made, roads traced and formed, bridges thrown, weirs made for fishing, and kraals for cattle, with numerous ditches, drains, sod walls, and sod huts. To these must be added the performance of an endless variety of services, which the wants and contingencies of a new and inhospitable colony rendered indispensable. Four of the detachment were discharged in the settlement, and the remaining four, soon after reaching England, left the corps by purchase or on pension.*

* Sergeant Hearnden, so frequently spoken of in these pages, purchased his discharge and emigrated with his savings, nearly a thousand pounds, to North America, where, from his enterprising spirit and commercial tact, he is realizing a fortune. Throughout his service of twelve years in the corps he was constantly employed on particular duty. In the practical instruction of the Cadets at Sandhurst and Woolwich, and in one of the early expeditions to the disputed territory in the state of Maine, he showed much talent and energy, and obtained great credit. For his services at the Falkland Islands no higher

testimony could be afforded to a soldier than the repeated warm acknowledgments of Governor Moody. A word may also be given about his horse. Blanco was brought from South America; was perfectly white, and exhibited signs of good breeding. Hearnden purchased him at a rather high figure; but his subsequent usefulness and hardihood in a trying climate gave him ample reason to be satisfied with his bargain. On the 7th January, 1847, at the Falkland Island races, Blanco had the good fortune to win the Governor's cup, worth 50/. The cup, made of silver, by Hunt and Roskill, stood about eighteen inches high, and was richly ornamented and chased. On one side the sergeant was represented mounted, with sword, sabre-tache, and gauntlets. In another panel was the inscription. The cover was very massive, and both cover and cup were lined with silver gilt.

1849.

Breach in the sea embankment at Foulness—Company to Portsmouth—Augmentation to corps—Homeward journey of the Arctic expedition—Private Brodie—Great Slave Lake party—Expedition arrives in England—South Australia—Sergeant R. Gardiner—Road-making in Zetland—Survey of Dover—Wreck of the ‘Richard Dart’—Miserable condition of the survivors on Prince Edward’s Island—Found, and taken to the Cape—Remeasurement of the base-line on Salisbury Plain—Shoeburyness—Eulogium by the Marquis of Anglesey—Fatal accident at Sandhurst College.

On the 10th January fifty-five men, under Captain Tylee of the engineers, were sent by express conveyances from Chatham to Foulness Island, near the entrance of the river Burnham on the coast of Essex, to repair the sea embankment which for about 200 feet had been forced away by a heavy sea. The detachment took with it a quantity of intrenching tools, water-boats, and stores, including 300 fascines and 3,000 sand-bags, which were made and filled in about three hours. In less than twelve hours from the commencement of the work, the breach was effectually mended by an ingenious placement of fascines and sand-bags, at an expense not exceeding 6*l.* 10*s.* The party worked in two divisions. The day was extremely wet, but the men laboured with the utmost zeal, and their conduct both on sea and land was exemplary.¹

A company was sent from Woolwich to Portsmouth in January to supply the place of the one removed from that garrison to Dublin in February, 1848. The return of a company to Portsmouth induced much opposition to its employment on the part of the civil workmen, and disparaging remarks, with respect both to its conduct and its mechanical abilities, appeared in the provincial journals of the time.

¹ The ‘Times,’ 12th January, 1849. ‘Corps Papers,’ 1, pp. 415, 416.

One company, the twenty-first, was raised 1st February, and another, the twenty-second, on the 1st March, thereby increasing the establishment of the corps from 1,985 to 2,185 of all ranks. The royal warrant, authorizing the formation of the last eight companies, is dated 22nd August, 1849, and on its authority the companies were organized as follows,—

				Corp.	Bugl.	Privates.	
17 Companies, Service, each .	1	4	5	5	2	83	100 = 1,700
1 Company, Corfu	1	2	3	3	2	51	62 = 62
3 Companies, Sarvey, each .	1	6	7	7	2	82	105 = 315
1 Company, Sarvey.. . . .	1	4	5	5	2	83	100 = 100
							2,177
Staff 1 Brigade-Major, 1 Adjutant, 1 Quartermaster, 2 Sergeant-majors, } 8							
2 Quartermaster-sergeants, and 1 Bugle-major, }							
Total							2,185

When the summer fairly set in, the arctic expedition under Sir John Richardson commenced its return. The van, with corporal Mackie, started about a week before Sir John, who followed on the 7th May with Mitchell, Brodie, and three seamen. In five and a half days the journey over the ice was completed, and on the 12th they encamped at Cape Macdonald, clearing away for the purpose snow to the depth of five feet. They then moved on to Fort Franklin, where the advance division had arrived with a good supply of provisions for the voyage. Soon afterwards a detached party was commissioned to Fort Norman for a barge and stores, for which Sir John Richardson waited nearly a month, having with him Mitchell and Brodie and two fishermen who, in the mean time, lived on trout, whitefish, herrings, and geese, and "bivouacked under the shelter of a boat's sail as a substitute for a tent." In time they quitted the vicinity of the fishing-hut, and moved to the banks of the Bear Lake river, where they encamped until the 9th June, when the descent of the river commenced. In the fishing coble brought from Fort Norman, Sir John Richardson with three of the party embarked, whilst Mitchell, Brodie, and a fisherman named Morrison, walked along the bank of the river, each of them carrying his own bedding and clothing.

Narcisse, another fisherman, was left behind in charge of some stores. Half an hour after setting out, the party in the coble put ashore, "and in a short time Corporal Mitchell and Morrison joined them, but private Brodie, having struck into the woods with the view of making a straighter course, did not arrive in the hour that the chief waited for him;" and expecting that he had gone past, the voyage was resumed with Mitchell and Morrison added to the party in the boat.^a

Fourteen miles from the lake a *cache* was reached; and as Brodie had not arrived in the course of the day, it was evident he had lost himself, and therefore corporal Mitchell and Morrison were sent "back to the lake to acquaint Narcisse with what had happened, and to engage an Indian living at the fishery to go in quest of Brodie. In the meantime the party at intervals fired their fowling-pieces, and set fire to some trees, that the smoke might be seen by the strayed wayfarer at a distance."^b

Next day the men came back from the lake. "After placing written directions for Brodie in the *cache*, the expedition re-embarked, and in a short time came to the influx of the Black River, then flooded. There another paper of instructions was left for Brodie, directing him to the *cache* for provisions, and to remain with Narcisse until the barge came for him." "The incident," writes Sir John Richardson, "of Brodie's straying gave me much uneasiness, as I feared he would experience some suffering, though I did not apprehend he would lose his life. He was a man of much personal activity and considerable intelligence. When he discovered he was walking in a wrong direction, he began to mend his pace, and to run, as is usual in such cases, but took an inland course, and at length came to the borders of an extensive swamp. Here the woods being more open he obtained a distant view of the 'hijl at the rapid,' which he recognized, from having seen it on his former journey to the *cache*; and as he knew that he must pass it in descending the river, he resolved on walking straight for it, in the hope of arriving there before us. After this he came to

^a Sir John Richardson, ii., p. 138.

^b Ibid.

the Black River," a rapid, unfordable stream, scarcely passable by a raft; but, continues Sir John Richardson, "being a fearless swimmer, he swam across it carrying his clothes on his head. The stream being very tortuous, came again in his way, when he crossed it a second and a third time in the same manner; but on the last occasion, his bundle slipping off, floated away, and he regained the bank with difficulty in a state of perfect nudity. After a moment's reflection, he came to the conclusion that without clothes he must perish, and that he might as well be drowned in trying to recover them as to attempt proceeding naked. On which he plunged in again, and fortunately landed this time safely with his habiliments. He now refreshed himself with a part of a small piece of dried meat, which in his anxiety he had hitherto left untouched, and forthwith decided on finding the *cache* and returning from thence to the lake. (On the third day (11th June) he found my note, together with some provisions which had been suspended to a pole for his use, but he had so husbanded his own small supply, that he had still a morsel of dried meat remaining. He had no difficulty afterwards in joining Narcisse, by keeping sight of the river the whole way;"⁴ and in due course he joined the expedition at Fort Simpson, in a barge sent to receive him.

At this fort also joined the ten sappers who had wintered on the Great Slave Lake; and on the 25th June Sir John started again on his homeward journey, encountering a succession of hardships, until he arrived at Norway House on the 13th August. The services of the mission were now wholly ended, and of the sappers, Sir John Richardson thus recorded his opinion: "During the time these men were under my command, not a single act of disobedience occurred. Crews better fitted for heavy portage work and for the ordinary duties of a winter's residence in the north, might doubtless have been selected in the country, but none that I could have depended upon with so much confidence in adverse circumstances."⁵

The arctic travellers arrived in England in November 1849,

⁴ Sir John Richardson, ii., pp. 138-141.

⁵ Ibid. ii., p. 144.

when three or four, in recognition of their usefulness, received gratuities of 15*l.* each, and the remainder 10*l.* each.

Captain Freeling, R.E., appointed surveyor-general in South Australia, with a party of five surveyors—sappers and miners—sailed for Port Adelaide on the 6th March, and landed there the 21st June. These men were forwarded to the colony to fill the vacancies occasioned by men discharged. Captain Frome, R.E., who had commanded the detachment in that province since 1839, was recalled to the corps in consequence of his period on the seconded list having expired.⁶

Early in March one sergeant and five rank and file under the orders of Captain Webb, R.E., returned to Zetland to lay out and superintend the construction of the roads surveyed in the two previous years. Up to this time, there was nothing in the island that could be called a road, except from Lerwick to Scallaway, a distance of about six miles, which, though not finished, was passable for riders, &c. Captain Craigie, R.N., the commissioner for Zetland, accorded them high credit for their exertions in directing the work, and controlling the poor employed upon it; and in a report to the Edinburgh section of the Central Board, he thus wrote of their usefulness and merits: "I cannot close this report without bearing my humble testimony to the invaluable services of Captain Webb, R.E., sergeant Forsyth and the staff of royal sappers and miners, and recording the gratitude felt towards Government by the whole community, for their consideration in granting an officer

⁶ Sergeant Robert Gardiner, the senior non-commissioned officer of the party, by great assiduity and application so improved his attainments, that he was recommended for the appointment of clerk of works in the royal engineer department. His drawings of the Supreme Court of Adelaide gained him much credit, and his services were marked by skill, zeal, and usefulness up to the period of his discharge, in February, 1854. Military men, particularly in the distant south, have every means of improving their condition; and if they possess a commercial bias, may, with tact, accumulate wealth. Gardiner has not been unmindful of his interests in this respect, and he is in a fair way of making his fortune. Offered for his good services to the public the situation of foreman of works to the department at Hobart Town, he declined it, and he now fills an advantageous appointment in the survey department of the colony of South Australia.

so eminently fitted to conduct and carry out to completion, works of such public and permanent utility. But great and most important as these works unquestionably are, they fall into comparative insignificance as compared to the social regeneration now in progress, in the industrious habits of the people, and to which their efforts have mainly contributed. The patience, forbearance, the tact and temper with which Captain Webb and his staff have led the people on, step by step, to a knowledge of their physical powers; their indefatigable industry and disregard of difficulties of no ordinary kind in such a climate and country; but above all, their being looked up to as the organ and representatives of government in this remote region, have invested them with a moral influence among all classes which can scarcely be calculated."

In April eight rank and file from Chatham were employed under the direction of Lieutenant Stotherd, R.E., in completing the survey and contouring of Dover.

A detachment of one sergeant, one corporal, and twenty-six privates, with four women and nine children, embarked at Woolwich on the 3rd April, 1849, on board the brig 'Richard Dart,' for New Zealand, under the command of Lieutenant Liddell, R.E. The ship sailed from Gravesend on the 5th April, and made a pleasant voyage until the 15th June, when, to the southward of the Cape of Good Hope, foggy and rainy weather set in, which continuing till the 19th, the ship was carried to the north side of Prince Edward's Island and struck on the rocks. The waves at the time ran high, and within a few short minutes, the stern cabin-windows were stove in, the boats were filled and torn from the quarter, and while the vessel, beaten by a raging sea fell to pieces, wave after wave swept the decks and rigging and carried forty-seven of the crew and passengers into the deep. Of this number twenty-four men belonged to the detachment of sappers, who, with all their wives and children, and Lieutenant Liddell, perished.

Eleven souls only out of sixty-three were saved. Among those who escaped were the captain of the ship—Samuel Potter—and four sappers, named Thomas Inglis, Owen Devany,

James Reid and William Goldsmith. They took refuge in the mainmast rigging; and the wreck, having been driven broadside to the shore, the mainmast went by the board, falling fortunately upon the rock, and the survivors crawled along the shaking spar to the shore. The rocks being exceedingly steep and difficult of access, the men had to undergo much labour and fatigue in reaching the summit of the cliff, occasionally hanging on by fragile sea-weeds and every now and then throwing themselves into crevices to prevent the receding surge drawing them into the sea. Most of the party were barefoot and thinly clad. The night was cold; the snow fell fast and thick, and beating upon their drenched and shivering frames, their sufferings may possibly be imagined but never adequately described.

The island was a mass of black rocks, torn by volcanic violence, and wore an aspect of wild and sterile desolation. Selecting a small green spot where fresh water was found, they made it a temporary residence, and built with the wood recovered from the wreck and some sods, a small hut, which sheltered them in a measure from the bitter wind and frost. A few sperm candles and some blankets, washed from the wreck, were all that could be found to reward their anxious exertions. No provisions of any kind could be picked up; but at length, when forced by hunger, they killed some young albatrosses and fed sparingly on the raw flesh. The candles in this extremity became savoury morsels and were devoured with considerable relish. As they were without fire, or the means of procuring any to assuage the bitterness of their distress, they determined, on the seventh day of their deliverance, to explore the island and see what Providence might turn up to their hopes.

Two of the men, from being frostbitten and cut in the feet, were unable to walk. The remaining nine, therefore, started, leaving a stock of raw meat with the two sick sappers, who laid themselves down on the cold ground only to feel the increase of pangs which the presence even of a spark of fire would have helped to soften. Without a cheering ray to palliate their wretchedness, with the nipping frost gnawing their reeking wounds, they gave themselves up to the destiny which

seemed to await them. Hourly the toils and miseries of the adventurers increased. After travelling all day, sometimes over high hills covered with sharp vitrified cinders, sometimes on marshy ground up to their hips in bog, they stopped for the night by the side of a frowning rock. The rain poured in torrents; shelter could not be found; no expedient for kindling a flame succeeded; and in this deplorable condition they sat down on the charred ground, huddled together to preserve some little warmth among them, exposed throughout the night to the drenching storm, covered only by their blankets.

Next morning, resuming their travels, they gained a beach where four sea-elephants were lying basking in the sun, for the day opened with a cheering summer's warmth. Two of the monsters they killed, but made no use of them. Here the travellers waited for a few days to recruit their strength. The place was called "Double Beach," but no fissure or cavity could be found to hide them from the winds and rains; and so night after night, rolling themselves up in their blankets, they slept in the open air. After a few days, private Reid, with some others, returned to the first location to visit the invalids. Private Goldsmith—a mere lad, slim and weakly by nature—was much worse; his frame was frightfully emaciated, his agony intense, and his toes were sloughing with gangrene; but private Devany—constitutionally stout and strong—was improving though unable to walk. Three days they remained with their sick comrades to encourage and cheer them with a narrative of their proceedings and a recital of their hopes; and on the 1st July they again repaired to Double Beach, leaving with the sick men the raw flesh of six birds, equal to a week's provisions. Devany was most assiduous in his attentions to the dying man, and to save his poor mouth from the exertion of mastication, tore up the uncooked flesh into small pieces, and fed him. But the time came when he was no longer able to receive the morsels—the last struggle was upon him—and he closed his eyes for ever.

A snow-storm now set in, which lasted all night and throughout the day of the 2nd. Raw flesh was their only repast, and

of this, from the want of powder and gun, they could not obtain a sufficiency to sustain their strength. Weak and attenuated, and completely benumbed by exposure to frost and snow, but little could be done in the way of exploration. Nevertheless they lagged on in their desperate mission, like men contending against some crushing adversity, determined to win. Crusoes they could not hope to be in such a clime and such a barren sea-holm; but whatever was practicable to their ingenuity and strength, they adapted to their use to support life till deliverance gave them succour.

The night of the 2nd July was still more severe in its effects upon the spirits and constitutions of the party, and the rain poured on them incessantly. Miserable nights were these to spend their vigils. Up, however, they rose with the returning dawn—stiff and aching in every limb; then wringing the wet from their stanch blankets, and feasting upon the raw breast of an albatross, journeyed on to seek a retreat from the recurring storms. On the 3rd, private Inglis discovered a cave close to the shore, whither the party joyfully repaired; and as the day was fine, they dried their dripping clothes and blankets. Meanwhile, watching from their lairs upon the passing birds, they brought down eighteen from the wing to replenish their impoverished game store. Stones they threw as if fired from rifles and used sticks with an address not inferior to Kaffirs. Necessity indeed was indulgent to give certainty to the primitive means they employed to secure their prey. Next day, from the return of a severe frost, all power of feeling and motion left their feet and fingers, and confined them to the dreary cave for a full week.

Until the 26th July, the cave afforded them a partial retreat from the severe inclemencies of the weather. On that day, private Inglis, the most successful of the adventurers, discovered a small hut about three miles away, in which a number of men's names were carved. Under the last name was cut the words, "On a journey round the island, 27th May, 1849." This unlooked for intimation gave rise to strange emotions and speculations, and the last cloud of despair vanished before the

sudden hope which sprung up in his breast. How intensely did he gaze upon the portentous words! and how often did he read them to assure himself that the passage was not the insane impression of a diseased mind! Satisfied that the inscription was not a mental caprice, he started off to announce to his fellow-sufferers the purport of his discovery. All received the intelligence with wondering doubt. "Where! where!" burst from every lip, and hastening forward, they followed Inglis to the hut. There indeed was the "handwriting on the wall;" and seeing in that ominous sentence, the legacy of their lives bequeathed to them by Providence, each voice was swelled in thankful ascriptions to that gracious Power, which, hitherto, had so marvellously preserved them.

It was now resolved that the captain, one seaman, and privates Reid and Inglis, should take a circuit of the sea-girt isle, until they regained the cave, to see whether any one was near to help them. Having started, they reached the hut early in the morning; but as, at the time, it was blowing a heavy gale and snowing hard, they waited a day or two for the weather to moderate. During this interval they consulted together as to their future movements; and private Reid having volunteered to remain alone at the hut, the others commenced, on the 30th July, to make the special tour. Next day two of the party returned to the hut, so that on the 31st July the adventurers were thus dispersed—three on the search, three at the hut, two at the cave, and one of the two sailors in charge of the two sappers at the sick depôt. The explorers made a long march the first day, examining every nook and every cliff for fresh evidences of habitation. The rain pelted on them; the snow sat in flakes on their gaunt frames; and wearied and foot-sore they dropped at night on the spot where the last speck of twilight left them in darkness. Next morning they were early afoot, and onward they travelled in pursuit of what, so far, seemed an ignis fatuus. Resolved to win their spurs, they would not suffer despondency or gloom to cheat them of their expectations; and another morning had scarcely opened upon them when the reward of their endurance

and exertion was within their grasp. It was on the 1st August, when, after rambling about the island for no less than six weeks, shaken and enfeebled by hunger, pain, toil, and frost, they fell in with a party of twelve seafaring men in the service of Mr. Geary of Cape Town. The meeting was one in which mutual amazement and happiness were keenly felt; and for the following thirty-two days, no vessel having touched at the island, the Cape seamen generously shared with the adventurers their scanty stock of farina. Poor Goldsmith was still alive. The strangers carried him more than thirty miles to the cave on the south beach of the island in which they resided. One by one his toes dropped from his feet, and he perished on the 24th August. With every feeling of affection and sorrow for his unhappy fate, his comrades interred his remains on the spot where he ceased the mortal struggle.

The schooner 'Courier,' of Cape Town, at length brought up at the island with a supply of provisions; and the survivors of the wreck, after seventy-two days' sojourn in that bleak and desolate region, having embarked on board of her, landed at Table Bay on the 10th November, where they were gratefully welcomed and entertained by a party of the corps.⁷

A party of sixteen non-commissioned officers and men, afterwards increased to nineteen of all ranks, under sergeant James Steel, was detached on the 1st May with sufficient camp-houses, equipage, and stores, to carry out the remeasurement of the base line on Salisbury Plain, by means of the compensation bars invented by General Colby.⁸ No man or officer on the survey had ever seen the apparatus in position before; and sergeant Steel, therefore, has the credit of acquiring a full knowledge of the adaptation and uses of the various instruments belonging to the apparatus, unassisted by the teaching of any practician. This he achieved by more than three months' unwearied study of some manuscript records on the subject, and by closely observing the results of a series of experiments which he conducted.

During the first fortnight, the line, six miles and three-quarters in length as the crow flies, was three times measured

⁷ 'Cape Town Mail,' November 17, 1849.

⁸ General Mudge measured the line in 1794.

with the chain, marked off, cleared of wood, furze, and other obstacles, and again roughly surveyed. The little wooden encampment of the detachment was by this time in excellent order; and, after three days' tedious work in testing the apparatus by comparison with the standard bar, the first compensation bar in the remeasurement was laid at Beacon-hill. Owing to the steepness of the ground, and other causes, progress over the hill was both slow and wearisome; but having once mastered the descent, the operation throughout its length presented less difficulties than were at first encountered. From time to time the *sergeant* communicated to the ordnance map office at Southampton the obstacles, both physical and instrumental, he met with in his progress, and the contrivances he resorted to, to overcome them. The journal so sent was full of practical instruction, of a kind to be easily acquired on future reference, and was replete with interesting information.

The distribution of the party gave ample employment to every man, and the division of labour was adapted to the attainments of the men and the necessities of the duty. Corporal William Jenkins assisted the sergeant at the bars and microscopes. The latter compared the microscopes with the standard on Sundays; and frequently, after a severe day's work, the same process was necessarily gone through, and other adjustments of the instruments effected. Corporal Edward Harkin constantly attended to the aligning instrument, whilst one man assisted him in preparing the stations, &c.; two privates levelled the triangles for the feet of the supporting stools for the bars; two attended to the adjustment of the stools on the triangles, levelled the camels on them, and moved forward the microscopes, &c.; two carried forward the bars and point-carriers, and levelled the former and fixed the latter; one registered the bars and microscopes, and otherwise aided in moving them forward and adjusting them; one, a carpenter, made the pickets, and repaired the mallets, tents, &c.; four attended to the shifting and placement of the tents; one was sentry over the bars at the dinner hour and during the night, to prevent any disturbance in the apparatus; and two attended to the domestic and miscellaneous duties of the hut-

The camp occupied three different positions on the line. It was thus moved twice forward. On each occasion, for a few days, no progress was made in the remeasurement, and sergeant Steel with two privates, filled up the interval in comparing the bars and microscopes with the standards. In the meantime, the remainder of the detachment fitted up the portable huts in the position selected for them.

Great nicety and precision were required in the placement of the bars; and so rigidly did the sergeant enforce the strictest exactness in their alignment and contiguity, that he would not order the "move forward" until he satisfied himself that the possibility of an error in the operation was not likely to exceed the 10,000th part of an inch. In this way the work was continued till the 16th October, 1848, when the 3,484th bar shot over the old Sarum terminus of the line. This was followed by a spontaneous cheer, hearty and sustained, from the assembled party who thus commemorated the successful accomplishment of the operation. By previous computations from the Lough Foyle base, the perfect accuracy of the remeasurement was proved; for, not only did the predetermined bar reach the gun, but the very inch of it entered the muzzle.

To ascertain by the usual computations whether any error by the omission in the registry of a bar or microscope could be detected, the line was divided into three parts, and each part was used as a base for a minor triangulation. Very great care was taken in executing this triangulation, but it failed to discover any inaccuracy in the measurement. Sergeant James Donelan and corporal William Jenkins, with the two 3-foot instruments, carried out this special service.

The results of the two measurements stand on record as under:—

By General Mudge with Ramsden's steel-chains in 1794 .	36575·64 feet.
By sergeant Steel, with Colby's compensation-bars, in 1849	36577·95 "
Computed from Lough Foyle base	36577·34 "

The precision of the two operations by such different instruments is strikingly close and beautiful, and not only illustrates the excellence of the instruments, but the perfection of the work.

On the completion of the service, corporal Jenkins was intrusted with one of the great theodolites, and removed with a camp party from the base detachment to a mountain station. The remainder were soon dispersed on the general duties of the survey, and sergeant Steel, after again comparing the bars and microscopes with the standard measures, returned with the compensation apparatus, &c., to Southampton.⁹

On the 7th June, one sergeant and twenty-five rank and file were removed from Woolwich to Shoeburyness to erect temporary barracks, &c., for the royal artillery, and also to lay platforms, build batteries, and to execute the varied works which a new station might call for, both for the convenience of the ordnance troops and the interests of the service. The party was increased to thirty of all ranks in July, but in October following was reduced to six non-commissioned officers and privates. Ever since this period, a small detachment has been retained at the station to carry on the current repairs and improvements, and its strength has fluctuated from time to time, in accordance with the prevailing emergencies.

The convicts had been working for a time in repairing the main-sewer in the royal arsenal at Woolwich, but in consequence of the unhealthiness of the duty, were withdrawn from it. As the work was one of considerable importance to the locality in a sanitary point of view, volunteers to finish the drain were therefore demanded from the royal sappers and miners. One sergeant and eight privates at once undertook the work, continuing at it during a portion of the month of August, and its execution was effected without the slightest injury to any one engaged. This led the Marquis of Anglesey, then Master-General, on the 5th September to extol the labours of the party in these words: "I desire to mark my

⁹ While on Salisbury Plain he was visited by Lieutenant-General Sir Charles Pasley, frequently by Colonel Hall and Captain Yolland, and by about fifty other officers of the royal engineers; also by Professors Airy, Sheepshanks, and Cape. The last gentleman was very free in his inquiries. The mode of aligning the instrument did not, at first, satisfy him, but eventually the process having been minutely explained by the sergeant, he went away convinced and gratified. Captain Gosset was present at the laying of the first bar and Captain

"awhij - nt . . ."

high approbation and admiration of the gallant conduct of the corps of royal sappers and miners, in volunteering an unpleasant and even dangerous service in the cause of humanity. Such self-devotion, wholly devoid as it is of the stimulus of public honour and of glory, far exceeds the renown gained in the battle-field. I offer my thanks to all the individuals concerned."¹⁰

On the 6th October an experiment was made at the Royal Military College at Sandhurst, to blow in the barrier-gate of the bastion-fort, which cost the lives of the sergeant and one of the privates employed. Sergeant John Cameron under Major Adams, had the conduct of the arrangements and the preparation of the fuse. Nine pounds of powder were placed in a sand-bag having a canvas tube joining into the middle of the powder. In this canvas tube was fixed a grenade fuse with a piece of cotton in it, calculated to burn a sufficient time after the cotton should burst into flame. The bag of powder placed against the barrier, was covered over with a curved iron shield with a hole in it to permit the fuse to come through, and then four sand-bags were lodged against the shield. The arrangements being completed, all the sappers retired except the sergeant and a private to ignite the fuse. Suddenly the explosion took place, and at once the sergeant was blown into the wet ditch, and the private knocked down on the bern. Both were mutilated in a frightful manner and in a few days expired. The accident is supposed to have arisen from some defect in the fuse which was made by the sergeant. Sergeant Cameron was a zealous and talented non-commissioned officer, had several seasons been employed with great advantage at the college, and presented the institution with some interesting military models. His widow was granted a pension of 10*l.* a-year.

¹⁰ In the reign of Tarquin I., 606 B.C., a force of Roman soldiers, ordered to construct common sewers, considered the employment an indignity and destroyed themselves. The self-esteem of the Roman soldier which led to so fatal a result, had a different effect on the modern; for the pride of the latter, tempered by a consideration of duty, urged him into the midst of danger and for the sake of humanity to seek it. Reflecting too, that the service, though paramount, was too objectionable for even convicts to perform, the warm eulogy of the Marquis may not be regarded as undeserved by those on whom it was

1850.

Sir Robert Gardiner's opinion of the corps—Party to the penal settlement at Swan River—Detachment to New Zealand—Draft to Hong-Kong—Mining operations at Seaford Bay—Determinations of the latitudes of various trigonometrical stations—Sergeant James Steel—Professor Airy—The leisure of the sergeant—New method of acquiring a knowledge of chess—Hardships of a party landed at Rona.

EARLY in the year, Sir Robert Gardiner, the governor at Gibraltar, wrote a complimentary letter to Sir John Burgoyne, relative to the companies of the corps under his Excellency's command. "My opinion of the sappers," he says, "is everything that you, in your personal, natural, and official station would desire; their movements surprise me, and are proofs of the care and attention of the officers, who must be good tacticians, as well as good engineers."

On the 15th February, five rank and file embarked at Deptford in the 'Scindian' convict ship, under Captain E. Y. W. Henderson, R.E., for the Swan River settlement, and landed at Freemantle on the 11th June. The captain had been appointed comptroller-general of prisons, and obtained the authority of Earl Grey, then Secretary of State for the colonies, to take with him this small detachment. The men were experienced as soldiers and tradesmen: one of their number was a competent draughtsman and architect, and another was acquainted with surveying, camp-duty, and the mode of blasting rock. On their arrival in the colony, they were appointed warders over the convicts, as well to keep them in discipline as to direct them in the execution of the various works that might be undertaken for the establishment of a penal settlement and the development of the colony. The party was also intended to superintend the submarine operations required in the removal of the bar at the mouth of the harbour.

The rates of working-pay granted to them, ranged between 1*s.* 3*d.* and 2*s.* a-day. A full company has since been added to the command on the recommendation of Captain Henderson, R.E.

Late in March one sergeant and twenty-six rank and file embarked for New Zealand, under Lieut. F. R. Chesney, R.E., and landed at Auckland on the 26th August, increasing the detachment there to a half-company of forty-one strong. The removal of this party from Woolwich was occasioned by the loss by shipwreck, near the Cape of Good Hope, of the detachment which sailed for that colony in April, 1849.

Fifteen rank and file embarked on the 15th May for China, and landed at Victoria on the 18th October. This was the fifth detachment sent to that country. Two men sent from Woolwich in April, to superintend the laying of asphalt on the government works, arrived at Hong Kong on the 17th June.

At Seaford Bay, on the coast of Sussex, the sea had made considerable encroachment, so as to jeopardise much of the adjacent property, and also the defences and martello-tower in its vicinity. Large sums of money had been expended in the construction of wood groins and clay embankments, with only partial success; and as an effectual remedy, it was proposed to throw down by mining a portion of the chalk rock itself, in the direction of the tidal current, and thus cause it to accumulate the shingle and protect the land and contiguous property. The cliff was high, bold, and bare, and worn at the base into hollows and long perpendicular crevices by the lashing of the waves, which, at high water, rushed up its aged and craggy face. With the view to efficiency and economy, the Master-General approved of the operations being carried out by a detachment of sappers and miners; and accordingly two sergeants and forty-four rank and file of the fourth company left Portsmouth at the end of July under Lieutenant E. W. Ward, R.E., who, on arriving at Seaford, lost no time in commencing the interesting undertaking. Late in August, the party was increased by ten rank and file under Captain

Craigie, to assist in completing the final arrangements, and to take the military duty consequent upon the anticipated explosion.

The works were conducted under the direction of Colonel G. G. Lewis, R.E., with Captain E. C. Frome as his executive officer. In the face of the cliff, about thirty-five feet above high-water mark, a nearly horizontal gallery was cut a considerable distance into the chalk. The mouth of this gallery was approached by a ladder and platform, supported by scaffolding. Inside the opening a cave was formed for spare tools and materials, and another also was excavated at the end of the gallery for a similar purpose. At right angles from this gallery, extending fifty-five feet to the right and sixty-five to the left, were corresponding galleries, at the extremities of which were two chambers of about seven feet cube, containing 12,000 lbs. of powder each. Two wires, respectively in connexion with two of Grove's batteries, completed the arrangements for exploding these charges simultaneously. The chambers of powder were about seventy feet from the face of the cliff, and were intended to drive out its under portions and roll them towards the sea. Upon the surface of the rock, eighty-four feet from its edge, were sunk five vertical shafts, at the bottom of which other chambers were excavated, containing, in three of them, each 600 lbs. of powder, to be fired simultaneously with the two great charges. The two other chambers were not loaded, from the non-arrival of a sufficient quantity of powder. The shaft chambers were connected by wires to a Smees's battery, placed in a wooden shed erected about 180 feet from the edge of the cliff. The wires to convey the electric fluid to each chamber were covered with tape and varnished or tarred over. The galleries were tamped with sand and chalk, in bags, to within fifty feet of the mouth, both branches being tamped up, and twenty feet down the large gallery. "The men worked in reliefs for the whole twenty-four hours. For the gallery three reliefs of four men each, were appointed; and subsequently for the branches three reliefs of six men for the two. . . . The relieving hours were 6 A.M., 6 P.M., and midnight, except at

periods when the high spring tides prevented the relief passing a projecting part of the cliff at the proper hours, when arrangements were made to equalize the extra time the men were employed. . . . The work was hardly ever interrupted in its progress, for by compelling each relief to be in barracks six hours before their turn came for work, the men were invariably fresh at the commencement of their time; and as the working pay was good and the best miners were always employed, the average amount of work performed by night equalled that accomplished by day."

All the necessary operations being completed, the great explosion, on a signal from the galvanic battery by sergeant Edward Wright took place on the 19th September, under the immediate orders of Colonel Lewis. The effect of firing the two great chambers was to throw out the under portions of the rock, which, from the downward pressure of the superincumbent masses, rolled with a convulsive heaving towards the sea, carrying with them the three smaller chambers unexploded, and causing deep fissures in the chalk as far back as the very foundation of the battery shed. The undertaking, so far as dislocating an immense mass of chalk from the cliff was concerned, was thus perfectly successful; but subsequent experience has thrown doubts upon its utility as a breakwater, for the chalk is gradually being washed away, and if some natural intervention does not take place to conglomerate the mass into a compact resisting body, time will remove the headland altogether, and expose as before the land and its defences to the gradual invasion of the sea.

The explosion was one of the largest that had ever occurred, and passed off without accident, delay, confusion, or inconvenience to any one of the detachment engaged, or to the thousands of spectators who witnessed the operation.¹ The quantity

¹ The accidental destruction of the three smaller chambers was providential, for had they exploded, the battery-shed, with Captain Frome and his assistant, would inevitably have been carried away, and crushed among the falling masses: as it was "the electricity of the two Grove's batteries, on igniting the powder in the larger chambers, caused an instantaneous disconnection of the Smee's battery from the smaller chambers, and, at the same time, the table on which

of chalk displaced was about 200,000 cubic yards, or about 292,000 tons. The distance the debris was hurled in front of the original line of cliff was more than 300 feet. The average breadth of the mound formed was about 360 feet, and its mean height about 50 feet.

Much of the expense of the service was paid by Mr. Catt, jun., a miller, to whom the surrounding property belonged, and who, as well for his own interest as for the welfare of Newhaven and its harbour, undertook a large share in the liability. The total cost of the work was 907*l.* 12*s.* 11½*d.* Of this sum only 92*l.* 3*s.* 1*d.* was spent on sapper labour, which included their services for levelling the ground, and other preliminary duties, excavating the galleries, shafts, and chambers, digging a trench above the cliff, loading and tamping the mines, making surveys and sections of the cliff and the works, preparing and laying wires, clearing away the debris, and various other miscellaneous duties, which the extensive and peculiar character of the operations rendered essential.

Lieutenant-General Sir John Burgoyne, the inspector-general of fortifications, Lieutenant-General Sir Charles Pasley, and a number of officers of royal engineers, were present to witness the explosion. Later in the day the non-commissioned officers and privates commemorated the success of their exertions with an excellent dinner. "Night and day," wrote Colonel Lewis, "the detachment worked with great zeal and alacrity, exposed to colds from draughts and alternations of temperature, and to injury from falling masses. Nevertheless, no material accident occurred to any one, and all gained the praise of their officers, and the respect of the inhabitants of Seaford for their courteous behaviour and good conduct."²

The observations made with Airy's zenith sector for the determination of the latitudes of various trigonometrical stations

they stood was jerked violently forward between two and three feet, upsetting the Smee's battery on the floor, and throwing out from the others also a quantity of the acids."—*Illust. Lond. News*, September 28, 1850.

² 'Professional Papers,' i., N. S., 68-86. Colonel Lewis's Paper in 'Jones's J. ...' November, 1850.

used in the ordnance survey of the British Isles, which commenced in 1842, terminated in December 1850, and the results have become the subject of an important volume from the pen of Captain Yolland, R.E. The instrument at first was in charge of officers of the corps, but in course of time, from a paucity in their number, it devolved upon corporal, afterwards sergeant, James Steel. The first man of the sappers honoured with the use of the instrument was private Benjamin Keen Spencer,³ who was employed with the earliest parties in carrying on the observations; and it is not a little curious to add, that General Colby directed his own personal observations, the work of his most able days to be tested by sergeant Steel. This is a striking proof both of the greatness of his mind, and his freedom from those petty jealousies which sometimes mar the superiority of distinguished characters.⁴

The following table (p. 48), taken from Captain Yolland's Sector Volume, "shows in a condensed form the stations observed from, the period during which the observations were in progress, the officer of royal engineers, or non-commissioned officer of royal sappers and miners in charge of the instrument, and the strength of the party; also the number of nights on which observations were made, and the number of observations registered at each station."

"The list of stars," says Captain Yolland, "selected for observation fell within the parallels of declination of $37^{\circ} 38'$ and $69^{\circ} 54'$. About two-thirds of this number were originally chosen, so as to admit of a continuous series of observations

* Now a quartermaster-sergeant. In his early career he was employed in the chronometrical determination of the longitude of Valentia, and for many years rendered very useful services in filling in the railways on the one-inch map. His talents and energy have singled him out at different times for the execution of particular duties. He was intrusted with the local superintendence of the survey, &c., of Her Majesty's domain at Osborne, in the Isle of Wight; and as a mark of approbation for the "attention and care" he exercised in discharging the duty, His Royal Highness Prince Albert presented him with a cheque for ten pounds. He also had subordinate charge of the survey made for the military encampment at Chobham Common.

³ 'Professional Papers, R.E.,' iii., N. S., p. xxiii.

⁴ Captain Yolland, 'Sector Volume,' p. xiii.

STATIONS.	Observations in progress.		Officer or non-commissioned Officer in charge of the instrument.	Strength of the Support.	Number of Nights on which Observations were made.	Number of Single Observations.
	From	To				
South Barule, Isle of Man	11 Oct., 1842	12 Oct., 1842	{ Lieut. Hornby } { and Gosset . . }	6	2	113
Blackdown, Dorset	26 Nov. ,,	1 Jan., 1843	{ Ditto }	7	20	1087*
Prevelly Mountain, Wales	11 Apr., 1843	10 May ,,	{ Lieut. Hornby } { and Layken . . }	5	17	674*
Forth Mountain, Wexford	29 May ,,	17 June ,,	Lieut. Hornby . .	7	12	859
Hungry Hill, Co. Cork	30 June ,,	31 July ,,	Ditto	7	9	295*
Feaghmann, Co. Kerry	14 Aug. ,,	28 Aug. ,,	Ditto	7	9	395*
Tawnymore, Co. Mayo	2 Oct. ,,	14 Oct. ,,	Ditto	2	7	294
S. End of L. Foyle Base	8 Nov. ,,	15 Nov. ,,	Ditto	2	8	335
Mousch, Stormoray Ben Hittich, South-landshire	16 June, 1844	3 July, 1844	Lieut. Gosset . .	5	10	180
Hensharrow, Cornwall	5 Nov. ,,	24 Nov. ,,	Ditto	6	10	480
South Barule, Isle of Man	9 June, 1845	14 June, 1845	Corporal Steel . .	4	6	290
Ben Leonard	27 July ,,	5 Aug. ,,	Ditto	3	2	114
Ben Hyniah, Isle of Trec	2 Sept. ,,	4 Oct. ,,	Ditto	4	11	635
Week Down, Isle of Wight	11 Nov. ,,	28 Dec. ,,	Ditto	4	10	267
Dunose, ditto	26 Apr., 1846	17 May, 1846	Ditto	4	11	556
Portface Down, ditto	24 May ,,	6 June ,,	Ditto	4	13	643
Port Valley, ditto	11 June ,,	21 June ,,	Ditto	4	7	356
Seavard, (Inst.) Shetland	26 June ,,	14 July ,,	Ditto	4	10	411
Gierth of Scaw, ditto	3 Oct. ,,	26 Jan., 1847	Ditto	4	20	566
Balta, in Shetland Isles	16 Feb., 1847	10 Apr. ,,	Ditto	4	21	581
Cowbythe, Banffshire	30 Apr. ,,	13 July ,,	Ditto	4	20	732†
Southampton	7 Aug. ,,	27 Sept. ,,	Ditto	4	18	641
St. Agnes, Scilly	21 Oct. ,,	4 Sept., 1848	{ Sergt. Steel and } { Corp W. Jenkins }	2	180	8730
Goonhully Down, Cornwall	13 May, 1850	1 June, 1850	Sergeant Steel . .	4	11	418
North Rona, Co. of Ross	25 June ,,	28 July ,,	Ditto	4	9	442
Great Stirling, Aberdeenshire	11 Sept. ,,	16 Sept. ,,	Ditto	4	5	428
	14 Nov. ,,	6 Dec. ,,	Ditto	4	9	439

* Private B. K. Spencer took a few observations at these stations.

† A few observations were taken at this station by Corporal Jenkins.

being made when the weather proved favourable throughout the night, and two observers were for some time employed with the instrument, who relieved each other after an interval of several hours' work. The observations were frequently carried on continuously for upwards of eight hours, but six hours' constant observing was reckoned a good night's work for one person, in consequence of the fatigue caused by his having to ascend twice to the table to make each complete or double observa-

tion."⁶ In the course of the service additional stars, not originally selected for observation, were occasionally observed, some of which were not found in the works of the best authorities.⁷ Two men, ready penmen, were also employed in booking, and afterwards copying, the observations on the skeleton forms, for transmission to the map office at Southampton, where the necessary computations in connection with the observations, were carried out and completed under the direction of Captain Yolland, R.E.

It would be out of place here to make any copious detail of the employment of the sappers on this special duty, belonging as it properly does to the history of the operation, and being so amply recorded in Captain Yolland's Sector Volume; but exception may fairly be taken to a few particulars in the personal services of the sergeant, which may prove interesting to the reader, and induce other non-commissioned officers in the corps to render themselves not only useful to their officers, but to deserve, in executing any important duty for which they may be selected, their confidence and approbation.

Sergeant Steel's first station was at Hensbarrow,⁸ from which he was removed to South Barule, and after completing his observations there, he was stationed for a time on the wild and romantic hill of Ben Lomond. There he witnessed a phenomenon which, perhaps, had never before been seen by any one. He had frequently been *above* the clouds, and at Hensbarrow, of a low altitude compared with Ben Lomond, he had observed the stars a whole night when the clouds *beneath him* were saturating with their vapour the little village of Roach below:

⁶ Captain Yolland, 'Sector Volume,' xiii.

⁷ *Ibid.*, xiv.

⁸ On journeying from Roach, in Cornwall, to Exeter, he sat by the side of the Astronomer Royal, who made various inquiries concerning the survey. At length, he asked, "What instrument have you been using?" "Professor Airy's zenith sector," was the reply. "Indeed, I am Professor Airy!" The surprise and pleasure of the sergeant, before unconscious of the presence of the eminent astronomer, may be left to the imagination of the reader to conceive. The incident is memorable, on account of the introduction, thus singularly obtained by sergeant Steel, and of the information he received from the Professor in the efficient use of the instrument, as well as in some salient points connected with astronomy.

but on Ben Lomond he saw extensive masses of cloud settle down into a level wide-spread stratum, the upper surface of which was at least 500 feet beneath the camp. This was after sunset, on the 10th September, 1845, with a beautiful moon and a clear blue sky above, altogether presenting an impressive *coup d'œil*. Such was the depth and density of the mass, that it required the powerful influence of the sun's rays for the two following days to dispel it. The whiteness of snow was grey, contrasted with the silver hoar of the heavy cloud when the sun rose on the 11th, and it offered, said Steel, in his forcible language, "a strong temptation to a lover of nature's wildest grandeur, to treat himself to a celestial walk on its upper surface to the peak on the neighbouring hill." Some tourists ascended the mountain on the 11th and 12th of September in the true spirit of enthusiastic enterprise, wishing to connect their names in history with this startling, yet truly magnificent phenomenon, but their amazement was indeed great, when, after penetrating the cloud, they saw above them an encampment of soldiers carrying on the official services of the station, with all the activity and fearlessness of men accustomed to such extraordinary appearances.

At Ben Helynish, in Tiree, one of the westerly isles of Scotland, the sergeant had to struggle in watching and taking a few observations between the almost incessant storms. Next he was employed in the remeasurement of the latitude of Dunnose, the southern extremity of a British arc of meridian, to verify its result as determined with Ramsden's zenith sector in 1802, and also to test the value of Professor Airy's sector. The observations for this purpose were carried on both at Week Down and Dunnose. "The near agreement in the results of the comparison proved very satisfactory as regards the work performed with both instruments; but to endeavour to trace the extent and amount of the disturbance that evidently affected the inclination of the plumbline at Dunnose," the sergeant afterwards made observations both at Boniface Down and Port Valley, in the Isle of Wight, by which "the difference in the geodetic and astronomical amplitudes between Greenwich and

Port Valley were found to be almost insensible, and the comparison with Boniface Down and Week Down tolerably good." The discovery, however, of singular disagreements in the observations at "one of the stations in the Isle of Wight, which had hitherto been looked on as the southern extremity of the longest of the British arcs of meridian, and where no sensible deviation could *à priori* have been anticipated, led to the re-examination of the northern extremity of the same arc, situated in Balta Island, by revisiting it, and by observing also from two other stations in the Shetland Islands contiguous to it, viz., Gerth of Scaw and Saxavord."⁹ The disturbance alluded to—the effect of local attraction—caused the plumbline and level to be deflected or acted upon, as a loadstone would influence the needle of a mariner's compass, and thus, when the levels indicated that the instrument was pointed at zenith, it was in fact directed to a point nearly four seconds to the north of it.

To Unst, in Shetland, the northern extremity of the arc just mentioned, sergeant Steel now repaired, and ascertained the existence of a disturbance at Saxavord, but in the contrary direction. This was fully established by taking a similar series of observations at the Gerth of Scaw, near Lambaness, and on the small uninhabited island of Balta. The relative position of these stations he fixed astronomically as to latitude, and geodetically by triangulation and levelling from the mean level of the sea, which involved observations with regard to the ebb and flow of the tides. By the series of observations so far made, it was clearly proved, that the latitude of a place could not be measured with the degree of certainty formerly supposed, and that though astronomers may profess to give seconds, tenths, and even hundredths of a second of their latitude, yet the real truth is, that the record may often be *several whole seconds in error*. The discovery, now confirmed by sergeant Steel's inflexible accuracy, is likely to produce some interesting discussion in the scientific world, and has already been made the subject of an

⁹ Captain Yolland's 'Sector Volume,' pp. xi. xii.

article in the 'Philosophical Journal of Science' for April, 1853, embraced in a review of Captain Yolland's Sector Volume ¹⁰

¹⁰ When oppressed by the monotony of his employments sergeant Steel sometimes resorted to the study of extraneous subjects to hold his mind fresh for his public duties. In this way he learned phonography and the grave game of chess. The latter he acquired not by the teaching of any interested instructor, but by an examination of a series of numbers of the "Illustrated London News."

It may be allowed to expatiate a little on this matter. A gentleman, who had visited the Shetland group being kindly entertained by Mr Spence of Haroldswick in Unst quitted the country favourably impressed with the homestead of that good man. Shortly after, "The Illustrated London News" was sent to Mr Spence and has ever since been regularly forwarded to him, either by the unknown visitor or the proprietor himself. The mystery which still hangs over the generous transaction is not without interest in Unst. From Mr Spence the illustrated journal was weekly supplied for the perusal of the sergeant, then encamped on the lonely island of Balta, who after devouring its contents, turned his attention to the study of chess.

Discovering no analogy between the powers of the puppets and their forms or designations, he first applied himself to manufacture a suite of men, which should at least have the merit of corresponding in character with the authority they possessed. Imitating those fantastic shapes in which chessmen are usually carved and which indeed, seem as ancient as the grotesque figures on the court cards of a genuine pack, he devised a simple scheme to remind him of their powers. Thirty-two cubes of wood, sixteen stained white and sixteen black were marked with lines on all their faces agreeably to the ranks of the warriors and the liberty they possessed in moving over the board. The definitions were shown by black lines on the white cubes, and white on the black. The bishop having power to roam under certain restrictions, in diagonal directions, a piece was assigned to his reverence with diagonal lines marked across the square. The rook having a rectangular motion was indicated by a rectangular figure while the redoubtable knight, always moving obliquely, was reticulated with lines which pointed out the avenues of his march in quest of the enemy. The queen combining in her will the power of motion increased both by the rook and knight exhibited on her royal square the necessary lines to make plain the extent of her liberty. Just so with the king, who, in this respect had equal power with his consort but as the queen had authority to move forward or backward as far as the chequers were open and the king could only plant his royal foot in one check at a time, Steel, to show the curious difference between their majesties introduced into the king's ascent line, a pellet between each pair of lines to mark the limit of his government and distinguish him from his royal spouse. The pawn—the common soldier of the board—permitted only to move forward perpendicularly and to capture like his knight obliquely, was singled out from the other puppets by three lines issuing from a common centre—one directed upwards to the edge of the square and the other two diverging obliquely to the angles. By this facile application of geometrical combinations he never required to charge his memory with the relative powers and movements of the several pieces, and thus became a fair player at the game of chess.

After passing a station at Cowhythe Hill, in Banffshire, to verify the sector operations of 1813, and which object was satisfactorily attained, the sergeant fixed his observatory at Southampton, where, in carrying on the duty, he made various experiments to ascertain the cause of apparent errors. In taking the usual readings of the telescope micrometers, the value of the zenith point, derived from each double observation of a star, varied sensibly. To determine this more accurately, by ascertaining the true value of the divisions of the screw, and correcting the error involved in the reduction of the whole of the observation, he adopted the method of making two distinct observations of the same star without reversal of the revolving frame, in the manner described in the Sector Volume, page xxvii, and so excellent was this method considered, that the value of the screw thus obtained, was finally applied to all the observations.

In prosecuting the work, it was also evident, that the most northerly stars furnished the greatest, and the most southerly the least resulting latitudes. To arrive at the cause of this anomaly, sergeant Steel devoted much of his time to careful investigation, and his efforts and experiments were both ingenious and interesting. These embraced comparisons of the arc with Simms' dividing engine, by which the non-existence of any sensible error in the divisions of the limb that would account for the observed errors was proved; but it was at the same time clearly ascertained, after a patient examination of the micrometer screws, the levels, the lenses, and the fullest consideration of the law of expansion by heat or contraction either by cold or pressure, that the immediate cause of the disparity arose from the compression of the divided limb by the downward pressure of the upper screw pivot, which, at each station, varied in proportion to the degree of pressure supplied. This was, ever after, a special point of attention with the sergeant, and as, from the construction of the instrument, no absolutely permanent and uniform pressure could be insured at all times, he regulated its extent as well by his judgment as his recollection.

It was a rule with him, notwithstanding the apparent errors

that might be the result, to register his observations with the strictest exactness. Experience had taught him to expect them as well from local as from indefinable causes. He considered, moreover, that the more perfectly an instrument was constructed, the more honestly would it report the discrepancies of both maker and observer, and that although the conclusions would seem to be a volume of errors, more credit and merit were due to the observer for ascertaining, instead of concealing or covering his errors. Influenced by this novel consideration, he threw an amount of earnestness, care, and faithfulness into his work, that rendered his observations of the highest class for accuracy, and deserving of the fullest confidence.

At Southampton he was assisted in the sector service for nearly twelve months by corporal William Jenkins: the one observed from sunset till midnight, and the other from midnight till sunrise. His final observations were at St. Agnes in Scilly, Goonhilly Down near the Lizard Point, North Rona, and Great Stirling - the north-east peak of Scotland. By this series of observations, the arc of meridian, which before terminated at Forth Mountain in the county of Wexford, and Monach in Lewis, was extended to St. Agnes in the south, and to Rona in the north, a small, unknown, and stormy island, about 100 miles west of Orkney.

At Stirling, according to instructions, he examined the promontory to select for his observations a spot, which would be probably free from unequal attraction, and fix its position by triangulation. In this he was quite successful. The point was "so far to the east as to be out of the direct meridional line of attraction of the hills lying south of Cowhythe," and by this series of observations it was ascertained, "that the deflection existing at Cowhythe, is not general in those latitudes, and that the discrepancy between its observed and calculated latitude, is not due to an error in the figure used in computing the geodetic result, but to local attraction affecting the astronomical latitude."¹¹ The fact of local attraction was now fully established; but from some peculiarities of its influence in

¹¹ Captain Yolland's 'Sector Volume,' p. xii.

particular districts, the inference derivable from it is, notwithstanding the skilful conclusions of scientific men, that the figure of the earth is *different* to the commonly-received opinion of its form.

In these later services he and his party were alike exposed to dangers at sea, and to trials and privations on land ; and besides encountering many perils in difficult boat service, and in landing on almost inaccessible coasts and islets, they were on several occasions nearly shipwrecked.

A small party at Rona was subjected to severe hardships. Its number consisted of corporal Michael Hayes and ten civil labourers, who embarked with sergeant Steel's party on the 29th of August, 1850, to survey the island. On the following day, by a desperate effort, the corporal and his labourers pushed into the boat, and taking with them a little provisions scrambled amid the surf on shore ; but as the weather was boisterous, and there was no harbour or anchorage in which the schooner could lie-to, she was compelled to return that evening to Stornoway with sergeant Steel and the sector party. Several days were now spent in intrepid attempts to regain the island, but such was the roughness of the sea, and such the fury of the wind, that all efforts to do so proved fruitless ; thereupon, the master of the vessel considering the undertaking to be impracticable threw up his contract, and it was not until the 7th of September, when another vessel had been engaged for the service, that Rona was approached, and a landing effected. All this time, seven days and eight nights, corporal Hayes and his party were pent up in Rona upon a very scanty allowance of food, and exposed without shelter of tent or hut, or even the comfort of warm clothing, to the cold and tempestuous storms of that dreary and desolate island.

1851.

Malta—Portsmouth—Swar River—Brown Down batteries—Kaffir war—Strength of sappers at the Cape—Corporal Castledine—Attack on Fort Beaufort—Whittlesea, &c.—Skirmish near Grass Kop Tower—Also in Seyolo's Country—Patrol—Fight at Fort Brown—Patrol—Storming Fort Willshire—Patrols—Action at Committy's Hill—Gallantry of corporal James Wilson at Fort Cox—Patrols—Increase to the Cape by withdrawal of Company from the Mauritius—Sir Harry Smith's opinion of the sappers—Eulogies concerning them by Lieutenant-Colonel Cole and Captain Stace, R.E.

THE fourth company under the command of Captain Craigie, R.E., was removed from Portsmouth on the 3rd January, and sailed from Southampton for Malta, where it landed on the 17th of that month. This was a new station for the corps, and its employment there was recommended on the ground that its services would be of great advantage in the erection of the proposed fortifications, and in providing an efficient force for the purpose of defence, in the event of the contingencies of the times rendering its co-operation desirable. Head-quarters were established at Valetta, and a large detachment was sent to St. Clement's to build new barracks. Much opposition was shown by the working people to the employment of the company for months after its landing, and even violence in some instances was resorted to. The press of the island also entered into the controversy, and the 'Mediterraneo' used its agency in strong editorial articles against the company to effect if possible its removal from the island; but the 'Malta Times' ably defended it, and successfully exposed the statements of its contemporary. Malignant as the 'Mediterraneo' was, it nevertheless concluded one of its articles thus:—"The sappers and miners are, we admit, a

most efficient and therefore highly useful body of men everywhere."

Immediately on the removal of the company to Malta another from Chatham succeeded it on the works of the royal engineer department in the Portsmouth district.

The small party of five men at Freemantle, Western Australia, was this year increased to a company by the arrival of ninety-five non-commissioned officers and men under Lieutenant Wray, R.E. The additional force was sent out to superintend the convicts in the erection and repair of the various public works and buildings, and to afford military protection to the colonists in the event of any demonstration of the convicts against authority or the settlers. The first detachment of sixty-five non-commissioned officers and privates embarked at Woolwich 10th September, 1851, under Lieutenant Wray, and anchored in Gage's Roads 17th December, 1851. The second, under Lieutenants Crossman and E. F. Du Cane, R.E., of two sergeants and twenty-eight rank and file, embarked as a convict guard 21st October, 1851, and landed 2nd February, 1852. The number of women and children that accompanied the parties were seventy-one of the former and ninety of the latter, and ten children were born on the voyage. Located for a time as a sanitary expedient on a slip of land running into the sea, called Woodman's Point, the company was removed, as soon as the restriction was rescinded, to Freemantle, where the projected works for the formation of the convict establishment at once commenced. Many of the men were appointed instructing-warders, with working pay at 2s. a-day each. The company was soon after distributed in small sections through the penal district, superintending the formation of labour depôts for ticket-of-leave men, or working at their trades at the different convict buildings, bridges, &c., and also in the making of roads. One man for many months assisted in the duty of exploring and surveying a portion of the colony under the Surveyor-General; and another—private John Cameron—did good service as a diver in recovering from the wrecks of vessels on the coast, treasure and valuable property

An additional company was added to the Portsmouth district by the arrival at Gosport from Woolwich on the 10th December, of the second company under the command of Captain J. H. Freeth, R.E. The object of this reinforcement was to enable the commanding royal engineer to construct two large earthen batteries on the sea-shore at Brown Down, some two or three miles below Go-port. As soon as the works were completed, the company, early in April, 1852, was removed to Chatham for instruction in the field duties of the corps.

Hostile irruptions had occasionally been made on the frontiers of the Cape of Good Hope by the Kaffirs from the adjacent territories, and murders of peaceable subjects perpetrated, which rendered it essential to check by force of arms their incursions and their crimes. With that intention the first movement of troops took place in December, 1850. The opposition of the enemy was determined and furious, and there was every appearance in the onslaught to induce the belief that the contest would be severe and protracted.

At the period of the outbreak the total of the sappers in the colony, scattered to fifteen posts and forts on the frontiers, was about 200 of all ranks, and notwithstanding that their services were much required in carrying on the temporary defences in the several localities, they were, in this war, called upon for a more general co-operation than in any previous struggle in the colony.

From the unexpected firing of a field-piece from the tower of Fort Beaufort on the 20th January, 1851, it was feared that the enemy by some means had entered the place unobserved. Corporal Benjamin Castledine of the corps, without any delay, reported the circumstance to Colonel Sutton, Cape mounted rifles, and received his orders to assemble the troops under arms at their several posts. The order was promptly obeyed; but scarcely had it been effected when a reinforcement of the Graaf Reinet levy rode up, and the tumult was readily explained. The firing was given as a salute to the reinforcement by some imprudent civilians who had not communicated their intentions to the authorities. The people who had thus so alarmed the

fort were arrested, so that the affair might be fully sifted ; but while measures were being taken with this object by Captain Pennington and a detachment of the 91st regiment to secure the persons of the offenders, a concourse of people assembled at Colonel Sutton's quarters, where his lady was alone and unprotected, and there deported themselves with gross outrage, at the same time demanding an entrance. Corporal Castledine arrived at the moment, threw himself between the garden-gate and the excited people, and effectually prevented, by his firmness and military bearing, the ingress they so valorously sought. The party then made off, but all concerned were afterwards arrested to await the result of a full inquiry into their conduct. At this investigation, the explanations given being sufficiently satisfactory to exonerate them from the perpetration of intentional alarm or of complicity with the enemy, the Colonel at once released them from restraint. The "Graham's Town Journal" of the 8th February, contained some animadversions on the conduct of corporal Castledine in this matter, which led Colonel Sutton, in the impression of that Journal for the 22nd February, to vindicate in every particular the corporal's conduct, and added "Corporal Castledine is one of those well-educated, respectable, and efficient soldiers which are only at present occasionally met with. . . . During twenty-four years' service as a regimental officer I have never met corporal Castledine's superior in his position—seldom his equal."

In the attack on Fort Beaufort in which Hermanus was killed, corporal Castledine was posted with seven sappers in charge of a tower where the ammunition was kept, and commanded a 24-pounder howitzer mounted on it. The post of honour was given to this trustworthy non-commissioned officer in anticipation of an attack from Sandilli, who showed in force on the opposite side of the town. At the commencement of the action corporal Castledine was nominated to be garrison sergeant-major, and held the appointment until ill health compelled him to resign. This occurred in February, 1852, when Major-General Somerset, in a division order, acknowledged that "corporal Castledine had performed its arduous duties with the highest credit." Colonel

Sutton, for many months, was the only officer at Fort Beaufort, and on many occasions, when the nature of the service required his presence elsewhere, corporal Castledine commanded the garrison in his absence. Often he had to send escorts of provisions and ammunition to supply General Somerset's division, which service was always so satisfactorily performed that both the General and Colonel Sutton repeatedly commended him for his judgment, promptitude, and zeal.

Five rank and file attached to Captain Tylden, R.E., employed surveying in the territory of the chief Mapussa, being interrupted in the duty, were now necessarily occupied in adopting expedients for protection. Early in the year they assisted the inhabitants of Whittlesea in strengthening their houses against attack, and in converting the village into a strong defensible position. Afterwards they constructed a small musket-proof redoubt of dry stones, twelve feet square, with walls three feet thick and seven high, round their own camp, to protect the field guns, military stores, and equipment. The waggons were also brought into requisition, and stone walls were built up under them to render them defensible. By the evening of the second day everything was completed. Into this miserable post the Captain with his five sappers, one officer, a sergeant of police and his wife and four children, took refuge. The sappers worked so hard during the day that the Captain had to take his turn at sentry during the night.¹ Soon after these precautionary services, repeated actions took place between the garrison with the levied troops raised by Captain Tylden, and the neighbouring tribes, in every one of which, though attacked by an immensely superior force, the little band beat off their assailants with severe loss, and gained for it the admiration and thanks of the General commanding-in-chief. The desperation and difficulties of their isolation, coupled with the paucity of their numbers, whetted their spirit of enterprise, and though their endurance and heroism might be equalled, they could never be excelled. In all the operations at Whittlesea, and in the actions with the tribes at adjacent places, as

¹ Letter from Captain Tylden in the 'Times,' April 23, 1851

many of the few sappers as could be spared from the redoubt and the village were engaged, who participated with credit in the frequent desperate attacks, exceeding twenty in number, which it fell to the good fortune of Captain Tylden to repel, and to his strategical tact and prowess to win.

Sergeant John Poole accompanied a patrol of fifteen mounted men on the 18th February, under Ensign Gill of the Cape mounted rifles, in pursuit of Kaffirs. Near Grass Kop Tower the spoor of cattle was discovered and followed up to within sight of Double Drift, where some cattle were seen in charge of about twenty of the enemy. Taking at once to the bush, half the detachment advanced, unperceived, until within a few yards of the kraal, where the Kaffirs fought for a short time, and then fled to the river. In crossing the stream, sergeant Poole shot one of the rebel Kaffir police, and one of the two other Kaffirs who were killed on the occasion. In this gallant affair the patrol captured 106 head of cattle, 2 guns, 3 horses, &c., and received the approbation of Sir Harry Smith. Sergeant Poole was second in command of the party.

One sergeant and twenty rank and file were attached, on the 28th March, to a patrol of 900 men under Major Wilmot, R.A., and assisted in the devastation of Seyolo's country until the 31st March. With a detachment of the 6th regiment the sappers remained in charge of the pack-horses and ammunition, and when attacked, vigorously dispersed the enemy. Private George Wilson killed two Kaffirs in this skirmish, and private Charles Jarvis was wounded, the ball striking the fore-finger and thumb, and lodging in the stock of his carbine.

Two rank and file under Lieutenant Jesse, R.E., were present in the field with Major-General Somerset's division from the 27th March to 9th April. During this patrol the country was scoured near the old Tyumie Post, Hertzog, Eland's Post, and the adjacent highlands. The two men were found very useful in repairing the numerous bad drifts through which the guns and waggons had to pass, and in the execution of various incidental services of a professional character.

Sergeant John Poole and one corporal of the corps were

present in repulsing a midnight attack on Fort Brown on the 9th April. The enemy consisted of ninety-three Hottentots and fifteen Kaffirs. Robert Dunlop of the corps was the corporal of the guard that night. Hearing the dogs barking more than usual, he went out to see that the sentries were on the alert; but finding the Hottentot posted over the cattle, away from his post in a cloak, he was satisfied of the existence of some traitorous design, and discovered that the enemy was already in the kraal. Giving the alarm, the guard and the military in the fort were quickly assembled, and, under the command of Ensign Gill of the Cape mounted rifles, a sharp action for two hours was maintained, when the enemy was driven from the fort with great loss. The rebels attacked both the tower and the kraal; but from the latter they succeeded in carrying off about 200 head of cattle.*

From the 20th to the 24th April, four sergeants and seventy-six rank and file under Lieutenant Pasley, R.A., were despatched, with Major Wilmot's patrol, into the country of Stock and Seyolo. Near the Keiskama the sappers and artillery were placed in ambush to attack the flank and rear of the enemy, while the main body of the patrol engaged the Kaffirs in front. The country through which the division passed was very perilous, consisting of high kloofs and dense bush, broken by precipices. In this march the sappers assisted in destroying about 100 huts, several large gardens of the enemy, and capturing some large granaries of corn. In returning, the detachment, acting with the 6th regiment as skirmishers, kept the enemy at bay and desolated their crops.

On the 30th April, two sergeants and forty-eight rank and file, in burgher jackets, and laden with provisions and the usual war equipment, were engaged with the Kaffirs on the march from the Chunie junction to Fort Wiltshire, and shared in storming and driving them from the heights, where they had occupied a strong position, under cover of the ruins of an old tower and a detached outwork. On the 1st May the party was again in action on the Keiskama; and after five days' patrol-

* 'Parliamentary Papers,' Cape of Good Hope, June, 1851, p. 47.

ling through the territories of Seyolo, Stock, Sonto, Tola, and Botman, regained King William's Town on the 2nd May. The troops were reported to have conducted themselves admirably. As the sappers re-entered King William's Town, Sir Harry Smith welcomed them by saying, with characteristic cordiality, "Well done, my lads; you can both build works and storm them!"

Two sergeants and sixty-nine rank and file, from the 9th to the 13th May, were employed with Major Wilmot's patrol in the Amatola Mountains. In carrying out the service, the division penetrated difficult and precipitous fastnesses, surprised several of the enemy, and captured some cattle. The sappers were reported to have conducted themselves on this duty with willingness and zeal.

From the 17th to the 22nd May, one sergeant and twenty-one rank and file accompanied a patrol of 800 men under Major Wilmot to Seyolo's country as far as Fort Peddie, and returned with a convoy of waggons, cattle, &c. A similar patrol of two sergeants and forty-one men scoured the Amatola range, was once engaged with the enemy near Bailie's Grave, and returned to King William's Town, after a harassing march of seven days, on the 31st May. One sergeant and twenty men were out with another detachment under Major Wilmot as far as Fort Peddie. The march extended over ten days, and the patrol returned to King's William's Town on the 14th June. Again from the 19th to 21st July two sergeants and forty-nine men were detached with Colonel Eyre's patrol, and assisted in clearing the rebels out of the Buffalo Poorts and Mount Kempt. The marching was very heavy, being for the most part, between eighty and ninety miles, through dense bush.

Under Captain Robertson, R.E., four sergeants and seventy-seven rank and file quitted King William's Town, with the force, about 400 strong, under Lieutenant-Colonel Burns of the 2nd Queen's on the 30th August. A body of Kaffirs and Hottentots being at Committy's Hill, the troops marched on the 1st September from their bivouac at Fort Montgomery Williams by Breakfast Vley to the hill. One division of the

sappers was extended as flankers on each side of the advancing column, and upon them a galling fire was soon opened from the bush. The sappers readily charged into it, and where the thicket could be penetrated drove the enemy back; but the denseness of the kloof in rear afforded the Kaffirs much security in retreating. Having ascended the summit of the hill, the sappers faced right about, and made a rapid charge down the hill on the enemy, who were gradually collecting in the bush from which they had just been driven, and inflicted considerable loss upon them. The charge was made with cheering, yet not in a hurry; the men stopped at each kloof and fired volleys into it, and then dashed after the fugitives. "It is most gratifying," writes Captain Robertson, "to report the admirable and gallant conduct of the men under my command during this conflict which lasted nearly three hours, and of the readiness with which they advanced to carry off the wounded of their own and of other corps under a heavy fire." The officers of the 2nd Queen's spoke in terms of high commendation of the spirited manner in which the sappers acted, and of their cheerfulness in obeying their officers. Private James Murray behaved with great courage in exciting the men both of the 2nd and his own corps to follow him. Running forward like one whose life depended on the action of the moment, he was followed by several who lined the bush to which he drew them, and some fell in their gallant exertions. Among them was private James Fergus, whose arm was pierced by a ball which passed through the left breast and out near the spine below the heart. He died in camp soon after the action. Private Patrick Conroy, a cool and brave soldier, fired at a Kaffir more than 300 yards away and killed him. Private John Arthur came in contact with one in passing round a bush, and in a personal conflict laid him dead at his feet; and private Robert M'Intosh, whilst in the act of ramming home a cartridge, saw a Hottentot about to fire at him, but not having time to withdraw the ramrod capped and fired, and the ramrod passed through his opponent's body. Lance-corporal Hosick Cowen and privates Charles Foot and Thomas Brooking were wounded; the last severely.

At Fort Cox, on the 28th September, second-corporal James Wilson behaved with intrepidity in repulsing a meditated attack on the cattle-guard. A body of Kaffirs intended to drive the cattle from the post unperceived, and then to massacre the guard. Two civilians and the corporal happened to go out at the time for recreation to an unfrequented spot, and were unconsciously directing their steps to the bush where the enemy were concealed in ambush. Fortunately one of the two in advance fired a random shot, and suddenly more than 200 Kaffirs made their appearance. The civilians were in front, and the corporal considerably in rear followed in support. A sharp fire now opened on the corporal, and the enemy made a disposition to surround him; but the corporal stealthily retired, and took up a favourable position, from which he kept up an unerring fire on his adversaries, who fortunately for him seemed more bent on capturing the cattle than spending their efforts in beating down a single opponent. Taking advantage of their predatory activity, the corporal shot down five of the Kaffirs before any assistance was rendered by the military cattle-guard. On being apprised of the approach of the enemy, the guard lost no time in collecting and driving off the cattle to a place of security, but in the attempt two soldiers of the 45th were shot dead. The Kaffirs at once stripped them, and placing their red jackets on their own bodies, danced frantically at their triumph. While this scene of exultation was going on, corporal Wilson, through the intricate windings of the bush, cautiously neared the group, and firing, one of the savages received the ball from his carbine and fell dead. On the troops advancing, the corporal at once joined them, and assisted in driving the enemy from the post.³

* The incidents of this affair, for the most part, are taken from a Cape paper. One day this corporal was fishing in the Keiskama, armed with a loaded carbine, when he was approached from behind by a Kaffir. The latter fired, and corporal Wilson, who was untouched, fell as if killed. Warily the Kaffir neared the spot; but the corporal, watching his opportunity, jumped up and shot his opponent. The wound was not fatal, but a blow from the butt end of his carbine sealed the Kaffir's fate, and the corporal took home his head as a trophy

From the 14th to the 31st October, two sergeants and thirty-one rank and file served in the field operations with Major-General Somerset's division in the Water Kloof, Fuller's Hoek, Blinkwater, and Kat river. Again, from the 4th to the 7th November, two sergeants and forty rank and file were on patrol in Seyolo's country; and again, from the 1st December until the 18th January, nine rank and file were present in the long marches and difficult services of the division under Colonel Eyre. This party was intended to cut loop-holes in the missionary station at Butterworth. The India-rubber pontoon raft taken with the party, was used in the passage of the Kei. This service occupied two days, and the sappers worked with much ardour in its accomplishment.

With the exception of two or three patrols, in which the sappers were commanded by the officers already named, it was the good fortune of the corps in every instance during the campaign to be under the orders of Captain C. D. Robertson, R.E.

The cessation of the works at the Mauritius made the services of the company there available for duty at other stations. Accordingly, with the sanction of Earl Grey, the seventeenth company, under Captain Fenwick, R.E., quitted the island on the 25th October, and landed at the Cape of Good Hope on the 19th November. The force of sappers on the Eastern frontier now consisted of three companies, and counted 276 men of all ranks.

Speaking of the reinforcement Sir Harry Smith thus wrote to Earl Grey, under date the 4th October, "I assure your Lordship that I very much appreciate the value of this reinforcement. No officers and soldiers in Her Majesty's army do their duty in a more gallant and exemplary manner." On the same date, Sir Harry thus wrote to Sir John Burgoyne, the inspector-general of fortifications, "I have 120 sappers here now, under as gallant a fellow as ever lived—Captain Robertson. These men are the finest soldiers I almost ever saw, and have taken their tour of most arduous patrol duty heart and soul."

¹ 'Parliamentary Papers,' Cape of Good Hope, presented February 3rd, 1852, p. 164.

"From being employed on the works," wrote Lieutenant-Colonel Cole, the commanding royal engineer, "and their usual industrious habits, the men were generally found to endure long marches and fatigues better than the line, particularly in the commencement of the war." "Besides," said Captain W. C. Stace, R.E., "the performance of garrison, patrols, and escort duties in the field at most of the posts on the frontier, the works provided for in the annual estimates, and several special and numerous incidental services, many of them contingent on the war, were executed by the sappers and miners, and their important and valuable services have been duly acknowledged to me verbally by different officers. The want of such a body of men would have been seriously felt on many urgent occasions during the war, in consequence of the difficulty at all times, and sometimes impracticability, to obtain artificers when required."

1851.

GREAT EXHIBITION.

Sappers attached to it—Opening—Distribution of the force employed—Duties; general superintendence—Clerks and draughtsmen—Charge of stationery—Robert Marshall—Testing iron-work of building—Workshops—Marking building—Receiving and removing goods—Custom-house examination—Fire arrangements—Ventilation—Classmen—Private R. Dunlop—Clearing arrangements—Miscellaneous services—Bibery—Working-pay—Close of the Exhibition—Euconium by Colonel Reid—Also by Prince Albert and the Royal Commissioners—Honours and rewards—Their distribution—Statistical particulars—Lance-corporal Noon—Removing the goods—Return of companies to Woolwich—Contributors to the Exhibition—The Ordnance survey—And Mr. Forbes, late sergeant-major.

It was the good fortune of the royal sappers and miners this year to be associated with the Great Exhibition of the Industry of all Nations, by which its name and character, its acquirements and usefulness, became more extensively known, appreciated, and commended. For this honour, the corps is indebted to Lieutenant-Colonel Reid, the Chairman of the Executive Committee. Receiving the cordial concurrence of his civil colleagues, he represented to Prince Albert and the Royal Commissioners, the desirableness of military co-operation for carrying out the subordinate details of the work. The measure—at once approved of—was ordered to be carried into effect, and accordingly, three lance-corporals—Richard Rice Lindsay, Thomas Baker, and Charles Fear—were attached on the 11th September, 1850, to the executive committee. The two former were clerks and draughtsmen, and the latter an ingenious mechanic and modeller. Their first duty was to execute a plan and model of the proposed arrangements for the Exhibition. By the end of the year, fifteen rank and file, clerks and draughtsmen, including a founder and an engineer, were added to the party, who for a time were quartered in Kensington cavalry

barracks. By degrees the force continued to augment, and at last by the arrival of the fifth and twenty-second companies, under Captains Owen and Gibb, R.E., and a strong detachment under Lieutenant Stopford, R.E., who was appointed acting-adjutant, the corps, on the 21st April, 1851, counted 200 non-commissioned officers and men. This was the greatest number of the sappers ever employed at the Exhibition. The enlarged force was furnished on the ground that as the corps was composed of artisans, its services would be especially useful, particularly in the mechanical part of the arrangements. As soon as the small cavalry barrack was full, the subsequent arrivals at the Exhibition were quartered in the royal palace at Kensington, and ultimately the detachment in the former barrack was also removed to the palace.

Just prior to the opening of the Exhibition on the 1st May, parties of the corps placed barriers across the various entrances into the building and also at some of the naves leading into the transept. At each outer barrier a small section of men was posted to prevent its removal, or the ingress of persons not authorized to view or take part in the state ceremonial. Within the area of the transept a strong detachment was stationed near Her Majesty, to attend to any orders which Prince Albert or the Royal Commissioners might see necessary to enforce. As the crowd kept flowing in, the "temporary barriers to protect the space round the throne were in part swept away" by the excusable impetuosity of the throng, "and the entire space of the nave seemed to be permanently in possession of the spectators. In this emergency Colonel Reid called out a party of sappers who soon restored order, and thus," wrote 'The Times,' to whose columns these pages are indebted for the above description—"added one additional service to the many others which they had contributed for months within the walls of the Exhibition." With temper and management the confusion soon subsided, and by ten o'clock order was established, "and reasonable facility afforded for the royal progress round the nave of the building."¹ Immediately

¹ 'Times,' May 2, 1851

the Queen proclaimed the Exhibition opened, the sappers removed the barriers, and the avenues of the building were at once rendered free for the unrestrained passage of the people. For the temperate, quiet, and efficient conduct of the sappers on the occasion, they received the thanks of Colonel Reid, Sir George Grey, the Home Secretary, and Sir Richard Mayne, the Chief Commissioner of Police.²

The subjoined table shows the strength of the corps at the Exhibition at the beginning of each month from October, 1850, to December, 1851, and also illustrates the divisions of labour in which the several parties were occupied.³

RANKS—DISTRIBUTION	1850.				1851.											
	30th Sept	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December
Strength —																
Colour-Sergeants	.	.	.	.	.	.	2	4	2	2	2	2	2	2	2	.
Sergeants	.	.	.	.	.	2	4	6	4	6	6	6	4	3	2	1
Corporals	.	.	.	.	.	1	7	10	7	10	6	10	10	9	9	2
Second Corporals	1	1	2	2	2	2	3	10	13	7	14	10	13	10	9	3
Privates	6	5	6	9	11	31	142	156	169	153	137	144	142	132	154	17
Buglers	.	.	.	.	.	.	2	4	4	4	4	4	4	4	4	1
Total Strength	7	6	7	11	13	37	167	193	185	191	164	179	172	159	179	24
Distribution —																
General superintendence	.	.	.	.	.	.	2	2	2	2	2	2	2	2	2	.
Clerks, draughtsmen, autographic press, &c.	4	3	4	8	9	16	13	26	17	17	17	22	22	17	7	7
Charge of stationery, &c.	.	.	.	.	.	.	2	2	2	2	2	2	2	2	2	2
Testing iron-work	2	2	2	2	2	2	2	.	.	.	.	.	.	.	.	.
Modellers—workshops	1	1	1	1	1	1	1	2	10	10	10	10	8	7	2	1
Lettering and laying out passages	.	.	.	.	.	18	18	10	.	.	.	.	.	.	.	.
Receiving, arranging, unpacking, and removing goods	.	.	.	.	.	.	44	46	23	28	.	12	3	5	12	4
Custom-house examinations	.	.	.	.	.	.	24	24	6	6	4	4	2	2	10	2
Charge of gates	.	.	.	.	.	.	2	2	.	.	.	.	.	.	.	.
Charge of fire-engines, &c.	.	.	.	.	.	.	14	9	20	20	20	22	20	13	3	3
Ventilation	.	.	.	.	.	.	.	2	2	2	2	2	1	1	.	.
Class superintendents	.	.	.	.	.	.	21	46	46	46	46	50	41	42	3	.
Training British side of buildings	.	.	.	.	.	.	.	38	18	38	38	37	39	.	.	.
Collecting and arranging specimens	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
On guard	.	.	.	.	.	.	4	4	4	4	5	5	5	4	4	4
Cooks and cooks' mates	.	.	.	1	1	1	10	8	9	9	5	5	5	5	10	1
Sick	.	.	.	.	.	.	7	9	12	5	2	2	1	1	2	.
Absent from various causes†	.	.	.	.	.	.	.	1	3	1	1	2	2	3	.	.
Tailors	.	.	.	.	.	.	3	1	.	.	.	.	.	.	.	.
On command‡	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Total	7	6	7	12	13	37	167	193	185	191	162	176	172	159	179	24

Part of day only.

† Duty, furlough, pass, &c.

‡ Clerk, Royal Engineers' Department, Glasgow.

² First Report of Royal Commissioners, Exhibition, App. xxv., p. 128.

³ Ibid., App. vi., p. 50.

A brief but more extended exposition of their duties than the above detail adduces, is here given to show the general nature of the connection of the sappers with the Exhibition, and the availability of the men to discharge onerous duty and varied occupation.⁴

One of the colour-sergeants during the arrangements superintended the sappers on the British side, and the other on the foreign side. After the opening of the Exhibition, colour-sergeant Thomas Harding acted as sergeant-major; and colour-sergeant Noah Deary as foreman of works, in the repair of damages which accidents and the pressure of the crowd were continually causing to the railings, counters, &c. On two or three occasions when there was a press for money-takers, colour-sergeant Deary and sergeant Thomas P. Cook and William Jamieson did duty as collectors.

The clerks were employed under the various officers, military and civil, of the Executive Committee; the draughtsmen, partly under Sir W. Cubitt and Mr. M. Digby Wyatt, when they found such assistance necessary in the superintendence and record of the progress of the building; but principally under the Executive Committee, in making the numerous plans which were necessary during the preliminary arrangements. It was from their surveys and drawings that the plans in the Commissioners' First Report were made. The men employed as clerks and draughtsmen varied at different times from three to forty in number. One of the men, lance-corporal John Pendered, was also employed in working an autographic press, which was useful when a few circulars were required at a short notice. The facility with which he acquired a knowledge of the apparatus was creditable to his aptitude, and the simple method he adopted to throw off the copies with rapidity and clearness proved him to be intelligent and skilful. The most distinguished of the draughtsmen were lance-corporals James Mack, Thomas Baker, and Nicholas Clabby, corporal Archibald Gardner, and lance-corporals Richard R. Lindsay and John

⁴ Chiefly from the First Report, Royal Commissioners, Exhibition, 1851, App. vi., p. 48.

Venner. The large plans, both of the ground and galleries, made for the convenience of the visitors, to enable them to find their way more easily to the parts likely most to engage their curiosity, and which were displayed at the south side of the transept during the later months of the Exhibition, were prepared by corporals Mack, Baker, Gardner, and Clabby. Both were considered to be highly-creditable specimens of drawing, combining boldness and skill with perspicuity. A daily journal, after noticing one of the drawings, thus wrote of the sappers, "Indeed that body have rendered invaluable services, not only in the general arrangements of the interior, but more especially in making those nice measurements which were essential with reference to the question of space." It then concluded its notice by making some flattering allusions to the proficiency of the sappers employed on the national surveys.^b The plans were each twenty-one feet long by six feet wide. Similar drawings on a very reduced scale, from which the plans in the first report were engraved, were executed by corporals Gardner, Mack, Clabby, Venner, and Lindsay, but the principal and most effective part of the work devolved on corporal Mack. The ground plan was drawn by the three first-named non-commissioned officers, and the galleries by corporals Mack and Venner. The interesting coloured diagram to show the fluctuations in the number of visitors, and other characteristic details, was wholly drawn by corporal Mack. The plan of the exhibition building to illustrate the water-supply, and measures for security against fire, was drawn by corporal Lindsay. These four drawings comprised the plans in the First Report.

The chart exhibited in the transept on the 6th October, to show by diagrams the fluctuations in the number of visitors to

^a The 'Times,' July 2, 1851. The reference is too good to be omitted. "The training which," proceeds the 'Times,' "under Sir C Pasley's system they undergo, admirably prepares them for this description of work, and they have brought to it the practical experience acquired during the Irish, Scotch, and English surveys, which it will be recollected they were employed upon in compliance with a most valuable suggestion to that effect made by Colonel Reid. The plan to which we allude is a highly creditable specimen of the skill which the sappers have attained in the art of surveying."

the building, was prepared by corporals Gardner and Mack, under the direction of Captain Owen. 'The Times,'⁶ said it was "a production of great merit and of much public interest, and resembled those scales of mountain elevations which are usually prefixed to atlases. The shilling days were the Himalayas and Andes of the chart; while the half-crown and five shilling days were represented by heights of much lower altitude." With the permission of the Executive Committee, these two non-commissioned officers compiled, on the same principle, a similar diagram with more copious general information, for the proprietors of the 'Weekly Dispatch,' from which an engraving was made, and copies in immense numbers were thrown off and issued on two stated occasions to the purchasers of that newspaper. Referring to the great chart shown in the Exhibition, the 'Weekly Dispatch' thus wrote: "This chart, which is beautifully executed, and is altogether a production of very great merit, reflects the utmost credit upon the authors—corporals Gardner and Mack of the royal sappers and miners, a corps which has rendered most intelligent and valuable service to the Exhibition."⁷

Corporal Baker, under Mr. Henry Cole, had the honour of preparing a coloured plan of the arrangements for Her Majesty, another for Prince Albert, one for the Duchess of Kent, and several for the members of the Royal Commission. He also surveyed the whole of the arrangements on the ground floor. In an instructive article in 'Chambers' Journal,' on the 'Crystal Palace,' allusion is popularly made to this portion of the sappers' duty, and it is justly added, that "the men were found very useful. All our surveying and planning have been done by them."⁸

During the latter months of the Exhibition, corporal Clabby recorded hourly the number of visitors who had entered the building up to the time of making the registry. This he did on a large sheet of paper fixed in the transept, at a sufficient elevation for the public to consult it. The rush at the moment

⁶ October 7, 1851.

⁷ October 12, 1851.

⁸ March 1, 1851, p. 130.

of making the record was always great, and the interest with which the corporal was greeted and questioned by the curious, was accompanied by many honourable indications of kindness and good will.⁹

Two men were in permanent charge of the receipt and issue of printed forms, and all articles of stationery to the various officers. Second-corporal John Vercoc was in chief charge. He also assisted as a clerk, and was pay-sergeant for Lieutenant Stopford's detachment. From the 2nd October, 1850, to 23rd January, 1851, he had the charge of the party then at the Exhibition, and for his courteous deportment and address, was well spoken of by those with whom he was brought in contact.¹⁰

Two men were employed during the erection of the building in testing the cast-iron girders and columns with an hydraulic press, &c., and in ascertaining that all the bolts were sufficiently screwed up; also in keeping a record of the ironwork fixed each day. This duty was intrusted to lance-corporals Robert Fleming and Joseph Barrow; the former tested the girders, and the latter the proper adjustment of the fitments and bolts. In cases of dispute about the practicable application of some defective columns and girders, the opinion of corporal Fleming was, on three or four occasions, sought for; and he gave it in

⁹ Apprehensive of accidents, the *public* registry of the numbers was, a few days before the closing of the Exhibition, abandoned at the instigation of the police authorities.

¹⁰ Robert Marshall, formerly a private in the corps, was also attached to the stationery department. From this he was promoted to be collector from the money-takers. After the Exhibition closed, he received a gratifying testimonial from Earl Granville, and a gratuity of one month's pay from the Royal Commissioners as a recognition of his services. In consequence of his industry and honesty, he was one of two or three retained for employment under the Commissioners, from whom he was transferred to the Department of Practical Art, to assist in superintending the reception and classified organization of the Trade Museum of specimens presented to it from all countries. In this duty his disciplined habits of order and arrangement made his services of great utility and value. He now holds a lucrative appointment as superintendent to a boarding establishment in London, under the Electric Telegraph Company, obtained for him, in consequence of his creditable conduct at the Exhibition, by Major-General Wilde.

so clear and manly a manner, that his views were readily followed by the contractors. It is not a little remarkable that this non-commissioned officer was the only sapper recommended by Sir William Reid for promotion, during the period that the Colonel commanded the corps at the Exhibition. Corporal Barrow, when not employed in examining the fitments, took his place in the drawing-room, and notwithstanding the rough occupation he had been accustomed to, was found efficient. For the successful stability of the building, some little credit is at least due to these two humble officials. Their exertions were very great, and their vigilance in the important work intrusted to them was fully equal to the responsibility.

Soon after the building was constructed, and before the goods began to be deposited, it was considered desirable to ascertain the effect of regular oscillation in the galleries. Experiments of different kinds were tried, but to carry out that which was regarded as the most trying, a strong detachment of the corps in close columns, keeping military time and step, was marched several times up and down, and round, and finally were made to mark time. With the result of this last test the eminent scientific men present expressed themselves highly gratified, and the incident was considered to be sufficiently interesting to become the subject of illustration in a popular journal.¹¹

Lance-corporal Charles W. Fear made, in the early part of the arrangements, a model of a portion of the building for the information of the Royal Commissioners, and afterwards was employed in making small models of counters of various parts of the building and other things of the kind required during the progress of the work. After the opening of the Exhibition a party was employed in repairing damages caused to the railings, counters, &c., and in copying, in model, some of the simplest and most instructive mechanical inventions and appliances for provincial institutions. The better to carry out the new style of constructing models, four of the party attended

¹¹ 'Illustrated London News,' March 1, 1851.

lectures on the subject delivered by Professor Cowper at King's College, Somerset House.

A party, varying from five to twenty-five men, all painters, was employed during the arrangements in numbering and lettering the columns, and laying down on the floor of the building the plan of the proposed passages and counters. Lance-corporal John Venner, who also worked as a clerk and draughtsman, was conspicuous in this division of duty. Corporal Archibald Gardner, also a draughtsman, was in great request for printing. The facility with which he lettered notices, labels, &c., required in *an instant*, brought him greatly into favour with the officials. The amount of work he had to execute rendered it indispensable that some more convenient substance than Indian ink, which took an immense time to grind, should be found. This he effectually provided, and thereby caused a considerable saving of expense. Gas-stoves were used in the Exhibition offices, in which he observed a very available description of soot to accumulate; and carefully collecting the material and mixing it with common ink and a little glue, he manufactured an abundance of a fine jet black preparation, which was always ready for emergencies.

The number available for unloading the goods when they were coming in varied from twenty to fifty men, and was not sufficient without the assistance of considerable numbers of porters from the docks. As the waggon containing the packages arrived within the building, they were driven to the centre of the transept and there unloaded and marked by a Custom-house officer. From the transept relays of sappers conveyed the packages in trucks to the compartment of the foreign country from which they had been consigned, where another band of Custom-house officers was ready to receive them. There was always a fresh supply of sappers with chisels and other implements to break open lids or other coverings, and who, with military determination, swept everything before them until the goods were revealed. This was the usual course of the reception arrangements.¹² "We have here," writes a

¹² The 'Times,' February 19, 1851.

London Journal, "to commend the aptitude and intelligence with which the force of sappers execute the duties intrusted to them. So quietly and precisely do they obey instructions, that their assistance is properly considered of material consequence to the punctual fulfilment of the arrangements in which they are concerned."¹³ Another thus writes, "The sappers and miners form prominent objects in the animated scene. Their work is principally to facilitate the reception of goods, and they get through all they have to do with great energy, and with a certain observance of military precision which is not without its interest to the looker on."¹⁴

From ten to twenty men were employed during the receipt of goods in opening the cases, and in assisting the Custom-house examination. Both in this duty and in removing the goods the greatest care was taken; so much so indeed, that only two or three accidents by breakage occurred to the exhibitors' property.

As early as January, 1851, while the building was still under the control of the contractors, a party of four men of the royal sappers and miners patrolled the building and its workshops every evening after work, remaining until they had seen every fire and light properly extinguished except those in the offices, where the great press of work rendered it necessary to allow fires and lights to be kept up during the night. With the addition of a party of the London fire brigade, this arrangement remained in force until the opening of the building, when a picquet of twenty-four men of the corps was mounted in the building at eight P.M.; this party on arriving at the Exhibition was marched round it to all the stations where the different fire-engines, fire-cocks, tanks, buckets, &c., were placed; thus every individual ascertained that all the stores were correct and ready for use. The whole of the men of the corps at the Exhibition had been drilled to the fire-engines, and made acquainted with all the arrangements undertaken to provide for the immediate extinction of any fire. The twenty-four men slept in the building every night, one man remained on sentry

¹³ 'Illustrated London News,' February 22, 1851.

¹⁴ The 'Times,' February 26, 1851.

to be in readiness to rouse the men in case of alarm, and a non-commissioned officer and two men patrolled the building every two hours. The picquet came off duty at six A.M., when another party of the sappers relieved them for the usual daily duty. This arrangement continued until the 4th November, 1851. The number was then reduced to twelve, and on the 11th November to two men, who remained all night in the building until it was again given over to the control of the contractors, Messrs. Fox and Henderson, in December, 1851.

By day two non-commissioned officers were selected, one for each side of the building, Foreign and British, whose sole duty it was to take charge of the men who belonged to the fire-party, and in conjunction with the men of the London fire brigade on duty at the building, they were held responsible for all the stores connected with the fire department, that everything was in its proper place and ready for immediate use, and also that the water was on, and the pressure not less than sixty feet. When the body of sappers was marched to work in the building each day, a party of twelve or fifteen men was allotted for each side of the Exhibition, and placed under these two non-commissioned officers, who distributed them to the various fire stations, and visited them during the day to see that they were at their posts, and alert.¹⁵ The promptitude with which this service was attended to was exemplified on an occasion when a fire, in the southern part of the Colonial collection, raised an alarm. The flue attached to a stove in one of the offices of the contractors having become heated, ignited a piece of wood with burning attached to it. A piece of the burning cloth fell into an open cask of Indian corn, but the drapery of the counter concealed for a time what had happened. Eventually the smoke began to break forth, and as soon as the existence of fire was ascertained, it was extinguished before it had time to do more than slightly char one plank of wood. The stores in charge of the non-commissioned officers were 8 engines complete, 40 cisterns, 16 hydrants, 410 spare buckets, 16 spare hose, 16 axes, 18 hand-pumps, and 15 fire annihilators.

¹⁵ First Report, App. xxvi., p. 130.

Opening and closing the louvre-boards for ventilation, and keeping a register of the temperature in the building, were attended to by a few of the men. The register was kept from 19th May to the 11th October, and the indications of fourteen thermometers were taken three times a-day.¹⁶ Corporal Thomas Noon was the chief at this duty, and was found very intelligent and attentive.

There were one or more men, termed classmen, attached to each class on the British side, who carried out the orders of the class and district superintendents during the arrangements, and also during the time of the Exhibition. The number of classmen appointed to the thirty divisions of the arrangements during the progress of the building, &c., was fifty-seven; and the number included in the organization for assisting in the classes during the exhibition, was sixty-one of all ranks. Five or six men also assisted on the foreign side, of whom two were attached to the Chinese court. The classmen afforded material help to the exhibitors and their assistants in displaying their property to advantage, and in protecting it.¹⁷ They likewise

¹⁶ First Report, App. x., p. 67.

¹⁷ One man, private Alexander Dunlop, in the machinery department, was the operator of an interesting experiment with an article of manufacture in which both England and France were concerned. The incident was related by Mr. Overend, at a public dinner, given at the Cutlers'-hall, Sheffield, to the Great Exhibition Local Commissioners for that town. Among the jurors there was a French Gentleman, who very properly showed great zeal in protecting the interests of his countrymen. He admitted that Sheffield had made the best files, but he maintained that there was a house in France that could make them incontestibly superior. He challenged Sheffield to the trial, and selecting the house with which he would make the test, it happened to be that of the Mayor of Sheffield, Mr. Turton, who accepted it. From France files were brought over for the purpose, and a French engineer was despatched across the Channel to use them. Messrs. Turton did not send to Sheffield to have files made specially for the occasion, but merely went to a London customer, whom they supplied with files, and took a few, indiscriminately, from his stock. Private Dunlop was chosen to use the English file against the French engineer and the French files made for the occasion. Two pieces of steel being selected upon which to try the files, they were fixed in two vices. The Frenchman was stripped to his work, with sleeves turned up, and all encumbrances likely to affect his strength and freedom of action, were removed. Dunlop was very differently garbed; his coat was buttoned up to the throat, and he was, in all respects, going, as it were, to parade. Both now, by a signal, began to work

were often found very useful in giving information to the public, and in conducting individuals through the masses, to those parts of the building which they were the most anxious to visit. Their courteous demeanour and intelligence were rewarded with repeated expressions of thanks and satisfaction, and the exhibitors were desirous to mark, in a substantial form, their appreciation of the services of the classmen, but it was declined on military considerations. Private tokens of respect, however, were frequently presented by some of the superintendents and class assistants to their military subordinates.

A party of about forty men came early in the morning during the Exhibition, and superintended a force of boys in sweeping the British side of the building. The arrangement was systematic, simple, and effective. Six hours—from four o'clock in the morning until ten—were dedicated to this purpose. Had it not been for the peculiarity of the structure, the duty of sweeping would have been insurmountable, but fortunately both floors and roof assisted very greatly to carry off much of the dust and dirt.¹⁸ After finishing the service each morning, the detachment was either kept as a reserve, or returned to the barracks.

In addition to the above they on several occasions assisted the police in their duties, especially on the opening and closing days; occasionally a few trustworthy non-commissioned officers issued tickets during the arrangements,¹⁹ and some of the

simultaneously, but Dunlop, a very powerful blacksmith, had filed the steel down to the vice before the French engineer had got one-third through. When the files were examined, that of Messrs. Turton was found to be as good as ever, while the French one was nearly worn out. The French juror then said no doubt he was beaten in that trial; but Messrs. Turton's file must have been made to cut steel only, whereas the French file was better adapted for iron. A new trial then took place upon the iron, and the result was still more in favour of the English file.

¹⁸ 'Fraser's Magazine'

¹⁹ This gave offence to one London periodical—the 'Builder' (April 5, 1851, p. 212). Its antagonism, however, is consistent, for it has always advocated that the services of the sappers should be confined purely to military duties, and that the national surveys, &c., should be wholly controlled and regulated by civil energy and operation. Still, with all its opposition, it spoke of the sappers at the Exhibition, in a qualified sense, as intelligent and efficient

privates rung the bells at the time the building closed each day. In assisting the police, corporal George Pearson detected an official personage, holding a lucrative situation at the Exhibition, taking money from the place in which it was deposited. The corporal for a long time watched his proceedings, and making known the case to the superintendent of police, the delinquency of the official was fully proved, and his dismissal from employment forthwith ordered.

During the preliminary arrangements the non-commissioned officers who issued tickets, and took charge of the gates and private entrances, were frequently besought by bribes to permit individuals the privilege of entering the building, &c., but no man of the corps was so wanting in a right sense of his duty as in this way to break the trust reposed in him. An instance of another kind was brought to the notice of Colonel Reid by sergeant Thomas P. Cook, who had a party under him employed removing goods from the hoarding to their destination in the building. Many of the exhibitors, wishing to insure a priority of attention in the removal of their property, offered considerations to effect it, but they were justly exposed, and the Colonel made it the occasion of complimenting the sergeant for his integrity.

The working-pay of the non-commissioned officers and men was 1*s.* 3*d.* a-day each; but from twenty-five to thirty of the most useful draughtsmen and others received 2*s.* a-day.

The Exhibition was closed on the 15th October, on which occasion small parties of sappers were posted at the barriers, and in the various passages leading to the transept, to assist the police in preventing the rush of the crowd. They were also placed around three sides of the dais from which the ceremony took place, and from which Prince Albert "took leave of all those who had given their assistance towards conducting the Exhibition to its prosperous issue."²⁰ The sappers were engaged the whole of the previous night in removing obstacles likely to interfere with the arrangements for the ceremonial. They also constructed the platform, or dais; and while attending, on the

²⁰ 'First Report,' p. xxxvii.

morning of the ceremonial, to the preliminary arrangements for the temporary accommodation of the Prince and the Commissioners, a sustained cheer was given by the visitors for the sappers, as a parting token of thanks and satisfaction for their past services.

Colonel Reid, now Sir William, on being appointed Governor of Malta, resigned on the 27th October, 1851, his charge in London, and the command of the corps at the Exhibition consequently devolved on Captain H. C. Owen, R.E. "I have," said Sir William on leaving, "the most perfect confidence that they will continue to the end of this service, to perform their duties with the same zeal which they have hitherto invariably shown, and with the same considerate and forbearing conduct towards all with whom they have been connected in this arduous undertaking."

The crowning testimony to the useful services of the corps was graciously given by Prince Albert and the Royal Commissioners in a letter to the Marquis of Anglesey, the Master-General of the Ordnance. In promulgating the letter,¹ a copy of which follows, his Lordship expressed his confidence that this high testimonial in approbation of the valuable services of those immediately concerned, would be received with feelings of pride and gratitude by the whole corps of ordnance.

"MY LORD,

WINDSOR CASTLE, Oct. 29th.

I have the honour, as President of the Royal Commission for the Exhibition of 1851, to convey to your Lordship, both in my own name, and in that of the Commission, our thanks for the cordial aid you lent us in allowing several of the corps of royal engineers, and two companies of royal sappers and miners to assist the executive committee in the arrangement and management of the Exhibition.

"Her Majesty's Commissioners consider it due to the officers of royal engineers, and to the non-commissioned officers and privates of the royal sappers and miners, who have been thus employed, to express to your Lordship, in strong terms, the sense which they entertain of the admirable conduct of the whole body while engaged in this novel, delicate, and responsible duty.

"The officers of engineers have, in the able assistance rendered by them, afforded another instance of the useful manner in which a military body may be employed in civil services during a time of peace.

"The Royal Commissioners, being desirous of marking their sense of the

¹ 'First Report,' App., vi., p. 49.

share which the different persons employed in connexion with the Exhibition have had in bringing it to a successful issue, have requested the various civilians so employed to accept a certain sum of money in recognition of their services. We have ascertained from Colonel Reid, that such a course would not be agreeable to the feelings of the engineer-officers who have similarly given their assistance, and to whom we could have wished to offer a similar token.

"With regard to the non-commissioned officers and privates, it gives me much pleasure to state, that at the period of the preliminary arrangements, when the labour required was sometimes excessive, their exertions were always cheerfully made. During the course of the Exhibition, they practically demonstrated the great value of their schools of instruction by the many useful plans which they drew; and by carefully acting always in subordination to the civil police force, they established for themselves a character for good conduct and attention to the exhibitors and visitors, greatly to the credit of the corps to which they belong.

"The Royal Commissioners have therefore thought fit to award a sum of 600*l.*, to be laid out either in drawing or mathematical instruments, or in other suitable lasting memorial of their connection with the Exhibition, for the non-commissioned officers and privates of the royal sappers and miners, to be distributed by the officers in such manner as your Lordship and the Inspector-General of Fortifications may approve; and we trust that you will give your sanction to the acceptance of these testimonials of their good conduct.

"I have, &c.,

"ALBERT, President Royal Commission.

"*Fried Marshal the Marquis of Anglesey,*

"*Master-General of the Ordnance.*"

In the first report of the Commissioners to the Right Honourable the Home Secretary, the corps of sappers and miners was thus alluded to: "In many parts of these arrangements, both before and after the opening of the Exhibition, the Commissioners derived the most important benefit from the co-operation and assistance of the corps of royal engineers and royal sappers and miners, who had been placed at their disposal."²²

To carry out the intentions of the Commissioners with respect to the disposal of the 600*l.* according to individual merit, a board of officers of royal engineers—Captains Owen and Gibb, and Lieutenant Stopford—laid down rules to guide them in the distribution. The cardinal grounds for exclusion were, that

²² 'First Report,' p. xxi. It may be worth remarking, that Mr. Cobden, the persevering enemy of naval and military establishments, was so satisfied with the conduct and services of the corps, that he was heard to say, he would never in his advocacy for military retrenchment, seek to reduce the numbers of the sappers.

none should participate in the rewards who had been less than a month at the Exhibition, or who had been sent to head-quarters in consequence of irregularity, or who had been notoriously idle and useless. Of this character it is satisfactory to add, that among the whole body employed, from the very beginning to the close, only two privates had earned the unenviable distinction.

The distribution of the grant was arranged into sums considered to be equivalent to the criteria of five specific classes of qualification and utility. On this principle therefore, the first class comprised men only, who in situations of considerable responsibility, drew public attention for their steadiness and general ability.

The second and third classes embraced men, who in various degrees called for favourable mention, and who displayed considerable aptitude and zeal.

The fourth class contained men, who not having the same opportunities of distinguishing themselves as the men in the previous classes, gained the commendation of their officers and others for attention to duty, and cheerfulness and exertion in its execution.

The fifth class comprised men who had only been a short time at the Exhibition, but who, nevertheless, rendered themselves, by their conduct and zeal, deserving of a slight memento of their services.

According to this classification, the prizes distributed were in value and number as follows :—

Class	Value. each	Number.
1st.	10 <i>l</i> .	13
2nd.	5 <i>l</i> .	41
3rd.	3 <i>l</i> .	41
4th.	1 <i>l</i> .	97
5th.	10 <i>s</i> .	14
Total . . .		206

The prizes embraced a selection of gold and silver watches, cases of instruments, portable writing-cases, and such other articles as would tend to increase the professional efficiency of

the men, and at the same time form a suitable and handsome memorial of their services. Every article was suitably inscribed with the owner's name, and the source from whence it was obtained.

In addition to these rewards, each non-commissioned officer and soldier, to the extent of the above number, received a bronze medal inscribed with his name, in a morocco case, to be kept as a token of useful services rendered, and also a pictorial certificate signed by Prince Albert.

The number of men sent to the Exhibition from September 1850 to December 1851, reached a total of 274 of all ranks. Sixty-eight of the number reaped no advantage from the grant. Of these, twenty-four had been removed to head-quarters for slight irregularity, two deserted, two did not participate on account of indolence, thirty-three were only three weeks at the Exhibition before it closed, and the remainder, seven men, were removed after short periods of employment, in consequence of illness.

Only one casualty occurred in the companies during their service under the Royal Commissioners. Lance-corporal Thomas W. Noon had obtained leave to visit his friends at Oxford, and was killed by a railway accident at the Bicester station on the 6th September. Liberally educated, and brought up to the profession of an architect and builder, he promised to be very useful both as a non-commissioned officer and foreman. In several situations of responsibility, he proved the superiority of his attainments, and was consequently one of the first men selected for duty in London. Mr. Wiltshire, under whom he was employed at the Exhibition, bore testimony to the value of his services. Much esteemed by his comrades, his melancholy end was deeply deplored, and his remains, interred in the cemetery of St. Sepulchre, at Oxford, were followed to the grave by a large concourse of mourners, among whom were seven non-commissioned officers of the corps from the Exhibition. In a funeral sermon, preached by the Rev. W. Mitchell, M.A., in Hornton-Street Chapel, Kensington, was given a review of the history and character of the deceased,

which awakened interesting sympathies in the crowded congregation.

The removal of the goods commenced immediately after the closing of the Exhibition, and all the available sappers were for some weeks employed in assisting the exhibitors and their assistants to pack their property, and remove it from the building. Soon these duties, from the rapidity with which the clearance was carried on, permitted a large force of the corps to be withdrawn, and accordingly, the 22nd company quitted for Woolwich on the 4th November, and the 5th company with the greater part of Lieutenant Stopford's detachment on the 11th November. Of the number left, a few were employed in collecting and arranging specimens presented to the Commissioners for the formation of a trade museum, and gradually the numbers were reduced to twenty-four, and by the end of the year to nine men only.

Among the contributors to the Exhibition were the Ordnance Survey, and Mr. Forbes, late sergeant-major of the corps. The Survey sent a number of artistic specimens of maps, one of which, Lancashire, was fifty feet in height and twenty-seven feet in width. A plan of the city of Dublin, on a scale of sixty inches to the mile, was the finest specimen of map engraving ever produced in the United Kingdom.²³ With this plan was associated the name of colour-sergeant John West, late of the corps, whose services have already received honourable mention in these pages. Among the other maps exhibited, which especially attracted attention, was one of the borough of Southampton, on a scale of six inches to a mile. For finished beauty of execution and truthful delineation of the various features of the ground, it was regarded as unrivalled. This specimen was executed by Charles Holland, formerly second-corporal in the corps, and who is still the leading draughtsman at the Ordnance Map office, Southampton. As already noticed in these pages, he received a case of instruments from Prince Albert for his talent in drawing a similar plan of Windsor. Six or seven specimens of electrotypes, to illustrate the different stages of the

²³ 'Hampshire Advocate,' May 10, 1851.

process of engraving the copper-plates, were also exhibited. Sergeant Donald Geddes assisted in mounting the maps, which from the colossal dimensions of one of them, was found very difficult; and he also arranged the various specimens in the space assigned to them at the end of the western gallery. "The Council gold medal was granted to the Ordnance Department who exhibited the maps, as a just and honourable tribute to the meritorious and scientific officers of that department who prepared them."²⁴ "For the copper-plate etchings, and for the use of the electrotpe process in reproducing the plates, our eulogium," say the Jurors, "is justly due to the establishment at Southampton, where they are executed."²⁵ Sergeant Geddes had from the first the charge of the electrotpe branch at Southampton, under the executive officers of royal engineers, Captain Yolland, and afterwards Captain W. D. Gosset; and by his skill and acquaintance with chemical science, attained that perfection in the art which, but a few years past, it would have been thought chimerical to expect.

Mr. Forbes exhibited a beautiful model of his *sphcrangular* pontoon in raft, with all its stores complete, and waggon for carriage. He also contributed the model of an apparatus for the ventilation of mines. Both objects were inventions of his own, and the former, though not adopted in the service, gained for him the present of one hundred guineas from the Board of Ordnance. Mr. Forbes was very late in submitting the articles, and they have therefore not been included in the official catalogues.

²⁴ 'Jones Reports,' Exhibition, 1851, p. 222.

²⁵ Ibid.

1851.

SHETLAND ISLANDS.

Observations—Road from Lerwick to Mossbank—To the western districts—And southwards—Between Olnafirth and Doura Voe—Voe to Hillswick; corporal Andrew Ramsay—Island of Yell; sergeant John F Read—Intrepid bearing of corporal Ramsay—Conduct and usefulness of the party employed on the roads.

FOR nearly four years one sergeant and five men of the corps had been employed in Zetland constructing some trunk lines of roads, with the view of relieving the wants of the poor of the islands, who, from the failure of their fisheries and other dreadful visitations, were threatened with starvation. Captain T. Webb, R.E., directed the operations of the party for three years, but throughout the fourth year, sergeant Robert Forsyth was alone responsible for its discipline and conduct. With respect, however, to the execution of the works he received instructions from Captain Craigie, R.N.

The roads constructed under the superintendence of the sappers were, considering the character of the country, its frequent storms, heavy rains, and bleak winds, and the utter inexperience of the peasantry in land labour and the use of implements, very extensive and difficult.

In 1849 there was scarcely a practicable road in Zetland, except a few isolated portions in bad condition. But on the removal of the party in January, 1852, more than 100 miles of excellent road, including the island of Yell, had been made practicable both for pedestrians and wheel vehicles.

From Lerwick to Mossbank, twenty-five and a half miles of good road were cut through a mountainous country intersected

with large plots of deep bog. It was fifteen feet wide clear of the water-tables. All through the line it was properly drained and gravelled to a depth of between fourteen and eighteen inches. The undulations of the country and the occurrence of streams called for considerable engineering skill. At different parts of this road were built two stone bridges, the first of fifteen feet span and twenty feet high, and the second of ten feet span. Both were of the best rubble masonry. In different parts of the line there were twenty-four large culverts built of dry masonry as substitutes for bridges. A number of cross drains were also laid and properly paved. About eight miles of the road ran along the side of a high hill, and here an embankment and wall were raised on the lower side, and a cutting made on the upper.

The road from Lerwick to the western districts was constructed over the steep and rugged heights of Wormiedale, for one mile of which a cutting was made from the upper side, which assisted in forming an embankment of five feet average on the lower. From thence to the head of Weesdale Voe the road ran comparatively easy. A large stone causeway, however, had to be built over the point of a sheet of water which communicated with the sea. In this causeway were six openings of two and a half feet by four feet for the free passage of the tide. From the head of Weesdale Voe to the Scord of Tresta, one mile, a cutting was made on the upper side, and a retaining wall built on the lower side of the road. To Gruting Voe, six miles, the road was easily prepared. On this line two bridges were erected: one at Bixter with piers of rubble masonry and the superstructure of stout oak, with a span of ten feet; the other at Tumlin of dry masonry with three openings. At the head of Gruting Voe, a causeway of stones, six feet high by thirteen feet broad, with seven openings of two and a half feet wide each, was constructed, crossing a part of the Voe for 120 yards, and thereby shortening the distance to Walls by three quarters of a mile.

From Lerwick, southwards, a road of twenty-three miles was formed to Dunrossness, and portions of the Test road were

also improved. Four stone bridges and a wooden one were constructed on this line over heavy and sometimes impassable streams.

From the bridge at Fitch, four miles from Lerwick, a road of one and a half mile long was made, which joined the Scal-loway road and the trunk line together.

From the main line at the Olnafirth branch another road was cut for three and a quarter miles, connecting Olnafirth and Doura Voc, whence there is an easy access by boat to Lerwick. One stone bridge of twelve feet span and nine feet high was erected on this line.

From Voc to Hillswick fifteen miles of bridle road were made, and two substantial stone bridges thrown over deep and rapid burns. The ground was very difficult, and in many places the red granite was so hard that blasting the rock was necessarily resorted to. This road passed through part of the parish of Delting, connecting it with North Mavine by a narrow isthmus about sixty yards wide from sea to sea. On the south of this the hills rose to a height of about 700 feet above the level of the sea, and terminated on the shore in very high precipitous cliffs. To surmount such a barrier with anything like tolerable gradients, it would have been necessary to make a detour of at least one mile and three-quarters over uneven and rough ground. To obviate this, a road was cut along the base of the bold cliffs of Cliva for 590 yards, which, considering the description of labour employed, was an undertaking of no ordinary kind. The method adopted was to blast the face of the cliff, in which only 250 lbs. of powder were expended, and this removed more than 10,000 tons of rock. With the dis-lodged fragments a retaining wall was built, which formed a rampart of thirteen feet broad and twelve feet average height. Some of the stones used in the wall were two tons weight.¹ Corporal Andrew Ramsay was intrusted with the execution of the work, and the fact that 1,700 blasts had been fired by him among a people unused to these operations, and without a single

¹ The particulars taken from sergeant Forsyth's statements in 'Report of Committee of Manage. High. Dest., 1852,' pp. 15-18, 35-37.

accident occurring, affords sufficient proof of his caution, discretion, and attention.²

In the island of Yell a road of twenty miles, nine feet wide, was cut between the two principal harbours — Cullivoe and Burravoe. The line was through a rugged country, with peat morasses, rapid streams, and mica and silicious rocks. In some places deep excavations were made before gravel could be obtained to form the surface of the road; and from the swampy nature of the ground much draining was required to render the foundation solid and the line durable. The danger of sinking in boggy ground for gravel was often felt. Once in particular when the party had dug to the depth of fourteen feet in a broken morass, the sergeant (Read) observed the whole mass of moss in motion. Instantly he ordered the workmen to leave the pit, Scarcely had they done so when the sides began to close in, and, as a rush of water at the same time came from beneath, the bog was quickly di-located, and toppling over, filled the pit.³ Owing to the inequalities of the surface it was difficult to carry on the line with easy gradients, and from Bastavoe and Mid Yell Voe, running far inland, its course was therefore circuitous. A bridge was constructed over the burn of Dalsetter in North Yell, ten feet span and nine feet high, with piers of strong masonry, while the cross beams, planking, and handrail were of substantial oak. A similar bridge was erected over Laxo burn, Mid Yell, and five large culverts, locally termed sivals, with heavy embankments, between that and Burravoe in South Yell. To accommodate South Yell, and to remove a serious obstruction to the conveyance of the mail and the passage of travellers in the winter season, bridges of ten feet span and seven feet high were erected over the dangerous streams of Hamnavoe and Arrisdale. In building that over Arrisdale a middle pier was erected, the span of the arch being otherwise too great to make it a sound work.⁴ Sergeant John F. Read was intrusted with the construction of this road. His conduct throughout his service in Shetland was

² 'Report of Committee of Manage. High. Dest., 1852,' p. 41

³ *Ibid.*, p. 19.

⁴ *Ibid.*, pp. 18-21.

correct and soldierlike.⁵ His report on the character of his operations in Yell, detailing the difficulties he surmounted and the improvements effected in the industrial habits of the people, is highly creditable to his ability.⁶

On one occasion while assisting the making of the Yell road, the conduct of corporal Ramsay, under peculiar and trying circumstances, elicited the praise of his officers.⁷ An outbreak occurred in his party, and being unarmed he was placed in a critical position. He was, however, cool and determined, and resisted in a manly but forbearing manner the demands of his labourers. By persuasion and command the angry feelings of the labourers were eventually allayed, and they were induced to resume with a more contented spirit the employment they so unsparingly abused.

In accordance with arrangements made by the Secretary of State for the Home Department, the connection of the party with the Highland Destitution Board closed early this year, and the men arrived at Woolwich on the 27th January. In parting with the detachment Captain Craigie, R.N., spoke highly of its efficient and creditable services and its excellent conduct. Privates Alexander Smith and David Muir executed all the masonry work on the roads. Sergeant Forsyth, in his character of superintendent, evinced considerable ability, zeal, and intelligence in the discharge of his duties, and was unremitting in his efforts to render Captain Webb's absence as little felt as possible.⁸

⁵ 'Report of Committee of Manage. High. Dest., 1852,' p. 41.

⁶ *Ibid.*

⁷ *Ibid.*

⁸ *Ibid.*

1852.

Party attached to the Commissioners for the Great Exhibition—Mount Alexander—(orporal John McLaren Spike Island—Brown Down Hurst Castle—Holmfirth Reservoir—Alderney—Cambridge Asylum—Tidal observations, river Dee—Van Diemen's Land—Channel Islands—Kaffir war—Passage of the Kei—Patrols—Party benighted in the bush—Action at the Kouap pass—Patrol—Fort White—Patrols—Expedition against Moshesh—Orange River—Passage of the Caledon—The Lieuw—Battle of Berea—Return of the expedition; crossing the drift at the Lieuw—Repassage of the Caledon—Perils of the "sick-waggon" in crossing—Thanks of General Cathcart—Conduct of the sappers during the campaign.

THE detachment in London under Captain Owen was throughout the year, attached to the Commissioners for the Exhibition of 1851. Four of the party were generally in the office performing the duty of clerks and draughtsmen. Among the services executed by them was the organization and classification, for historic and scientific purposes, of the voluminous correspondence, documents, and tabulated forms and returns of the department, previous to their deposit in the royal archives. To this was added the duty of preparing the various certificates with the signature of Prince Albert, and forwarding them, with the exhibitors' and jurors' medals, and juries' reports, to the different local and foreign committees throughout the world. To corporal Gardner was intrusted the office of stamping the Prince's signature. Before he commenced the task he made some experiments to ascertain the best mode of transferring the royal name from the block to the paper. His object was to make the impression a perfect resemblance of the original, to accomplish which the use of common ink was a desideratum. Observation and ingenuity soon led him to adopt an expedient

that proved to be very successful. About 20,000 of these certificates he prepared, and many of the transfers were such faithful fac-similes of the original, that the minutest examination of their details failed to discover the slightest deviation from the character of the royal autograph. For two or three months when the men were not employed on more pressing services, they were advantageously occupied in collecting and arranging specimens received from the exhibitors, now composing the trade collection at Kensington palace. They also examined and took charge of the Exhibition photographs, executed in Paris, 18,000 in number, after their return by Messrs. De la Rue and Co. who mounted them. In the evening after the day's labour had ended, five of the party attended for four months the Government school of design at Somerset House, and received instruction in free-hand drawing. The privilege thus conceded was not only unprecedented but greatly enhanced by an instant departure from the rule of the institution, which required candidates to avail themselves of its benefits in their turn. By the end of the year the sappers with Captain Owen were reduced to four non-commissioned officers.

In January and February two non-commissioned officers with six civilians as labourers, under Mr. John McLaren,¹ the

¹ Was formerly in the sappers, from which he was discharged a corporal in January, 1838, on a pension of 1s. 7d. a-day, after a service of twenty-three years. Most of his military career was spent on the survey of Ireland, in which he was found a zealous and correct surveyor. Soon after quitting the corps he emigrated to South Australia, and was hired by the Commissioners for the colony as a draughtsman in the land office. He was one of the first race of surveyors in the settlement, and his duties, carried on through an unexplored intricate wilderness, were extremely toilsome and trying. At one time the survey department was thrown into great difficulty by the resignation of the original survey staff, which was the more embarrassing as emigrants were pouring into the colony by thousands, and his land was rapidly purchased. In this extremity corporal McLaren, to meet the great and pressing wants of the colonists, exerted himself with untiring energy. The Governor, Colonel Gawler, in writing of his services ('Times,' November 7, 1846), said, "Corporal McLaren was a fine fellow, who would have answered all my purposes if I could have cut him up into ten or twenty living portions, but who, unhappily for me, was not thus divisible." He was afterwards attached to the department of the surveyor-general, and ultimately, by his commendable labours, his experience, and

deputy surveyor-general of South Australia, were employed in establishing an overland route from Adelaide to Mount Alexander. They laid out a line of road between these points through the wilderness, removed all striking obstructions, and formed at every practicable locality convenient wells of water for the use of travellers. The object of laying down this line of communication was principally to assist the transit of the "gold diggers" of the Mount and the contiguous country into Adelaide.

Twelve rank and file were sent from Woolwich in April to Spike Island, to superintend the convict mechanical skill and labour placed at the disposal of the Ordnance, in carrying on the defences of the island and other posts in Cork harbour. This measure was strongly urged by Colonel Oldfield, the commanding royal engineer in Ireland, on the score both of utility and economy; and the services of the party in directing the convicts in the quarries, the excavations, and at their trades, were followed by results, indisputably advantageous to the public.

The seventh company, employed first at Portsmouth and then at Gosport, in conjunction with the second company, in constructing the batteries at Brown Down, was removed in June from Fort Monckton to Hurst Castle, to repair its defences and construct new batteries. The men, not quartered in the castle, were provided with accommodation in a detached shed, which was converted into a barrack for the purpose.

Early in the year, under orders from the Home Government, four men of the corps under lance-corporal James S. Taylor, made surveys and plans of the Holmfirth reservoir and the country in its neighbourhood, to assist Captain R. C. Moody, R.E., in his inquiries to ascertain the cause of the bursting of its embankment and the consequent destruction of life and property. On the completion of the work the men were

valuable co-operation, received the appointment of deputy surveyor-general, which he now fills. His income is about 700*l.* a-year. A report by him ('Times,' September 20, 1852), on the overland route from Adelaide to Mount Alexander, is a fair specimen of his literary attainments and business-like habits.

commended for the active and able manner in which it had been executed, and received a liberal allowance for their services.

A new station was opened for the corps this year at Alderney, one of the Channel Islands, whither the eleventh company, under the command of Captain W. F. D. Jervois, R.E., repaired from Woolwich, and arrived at the island on the 30th June. Some four weeks after the men commenced the construction of the permanent works considered necessary in those precarious days, to enable the garrison to resist any attempt at invasion by the enemy. There being but little accommodation in the island for troops, unused as it had been to have soldiers quartered on it, the company was necessarily divided into two portions, and domiciled more than a mile apart, at Longy and Corblets. The "Nunnery" was constituted an hospital for the sick.

An appeal was made to the corps in June to subscribe towards the erection of an asylum for soldiers' widows in memory of the late Duke of Cambridge. From most of the companies it was met by contributions, which in the aggregate amounted to 101*l.* 17*s.*, and thus insured to the corps a permanent interest in the institution to the extent of nine votes at every election of a widow. The gift from the non-commissioned officers and men of the sappers was the most liberal that had been received from any regiment in the service.

Sergeant John Berry and one private, both surveyors, were employed under Captain Vetch, late R.E., from June to August, in conducting a series of tidal observations in the River Dee at Chester, for the harbour department of the Admiralty, and to carry out also the provisions of the "Dee Standard Restoration Act." The observations were to extend over a period of twelve months, but the service was concluded in a fourth of the time. The duty was very carefully attended to, and the registrations were always accurately made by the sergeant and his assistant.

One sergeant and fourteen rank and file embarked for Van Diemen's Land on the 19th July on board the 'Lady Montagu,' as a guard over convicts, in conjunction with a detachment of

the line under the command of Captain J. S. Hawkins, R.E., and landed at Hobart Town on the 11th December. The Lieutenant-Governor of the colony applied for the assistance of the sappers to constitute, in the first instance, the nucleus of an efficient survey body, and to carry on, both in the city and the distant bush, the trigonometrical and detail survey of the settlement. The men, eleven of whom were married and had families, were selected from the survey companies, and were all competent for the duty both as surveyors and draughtsmen. A change in the designation of the settlement caused the party to be denominated the "Tasmanian Detachment." Very early after its arrival, the legislative council of the colony showed much hostility to the employment of the sappers, and at last gained the point for which it had pertinaciously worked. After a service of nearly four years in the triangulation and survey of Tasmania, the detachment quitted Hobart Town on the 9th February, 1856, and landed at Sydney, for similar duty, on the 13th following.

A party of six men from Chatham was employed under Captain G. Bent, R.E., from 24th September to 13th December, in surveying and levelling the ground in the neighbourhood of St. Helier's, Jersey, to the extent of about ten square miles; and afterwards the same party was removed to Alderney, where, under Lieutenant Martin and Captain Jervois, it completed for military purposes a special survey of the island, in May, 1853.

Hostilities at the Cape were this year continued in the same desultory and unsatisfactory manner as in the previous year. The attempts for a fair open fight were quite unsuccessful, and the patrols undertaken to drive the enemy into action were equally as harassing and arduous as in any former war. In these operations the sappers participated to the extent of their numerical means, not without, in one particular instance, suffering greatly both in loss of life and property. The following detail embraces the active services of the corps on the Cape frontier this year.

A party of two sergeants and sixty-five rank and file, under

Captain H. C. B. Moody, R.E., returned to King William's Town on the 1st January, 1852, after three days' march in escorting supplies to Forts White and Cox.

One sergeant and thirty rank and file accompanied a patrol of nearly 500 troops from King William's Town, under the command of Lieutenant-Colonel Skipwith, 43rd regiment, on the 3rd January. Captain Moody with Lieutenant Fowler, R.E., commanded the sappers. The American pontoon was carried with the party. The division crossed the Kei on foot, at a drift, on the 7th and 8th. On the 14th Colonel Eyre's division appeared in sight, but as the Kei had then risen considerably, the pontoon was used with effect to cross the stream. About one mile and a half above the drift, at a point where the water was smooth though the current was strong, the raft was employed. The river was about 100 yards wide, with a muddy bottom; the bank was easily accessible by infantry, but not by cavalry or artillery. To form the communication a strong hawser was passed over to the opposite bank, and the pontoon, attached to it by two short lines with running loops, was passed from shore to shore, carrying forty men at each trip. On the first day, seven companies of the 73rd and 60th regiments were in this manner ferried across, as also about 100 Fingoe women and children. During the day the tide again rapidly fell, and the waggon, &c., crossed the stream at the main drift. Captain Moody, in reporting upon the conduct of his detachment, said, "Nothing could exceed the energy and willingness with which they all worked."

From the 31st January to 2nd February one sergeant and forty rank and file, under Lieutenant Fowler, R.E., accompanied the patrol under the command of Captain Campbell, Cape mounted rifles, and, supplied with sickles, assisted in devastating the crops of the enemy in the neighbourhood of Perie and cutting off their supplies. On the Mangoka river a like razzia was effected, and after a night's bivouac on the Gwokkobi, several huts were burnt and fifty acres of corn cut down. Further destruction was carried on up the Gwokkobi and Umnaza rivers to the Perie station, to the extent of eighty

acres. After a slight skirmish with about 200 Kaffirs in the Perie bush, the patrol returned to King William's Town, laying waste in its route the gardens in the vicinity of Fort Beresford and down the Umtabini to the point of its junction with the Buffalo river, comprising another area of about eighty acres of thriving corn.

Captain Fenwick, R.E., with twenty rank and file, formed the European part of an escort of 100 strong, which conveyed supplies in five bullock waggons, in addition to seventy head of cattle, to Major Kyle's column in the Tomacha—a distance of seventeen miles from King William's Town, to which place the detachment returned on the 5th February after two days' patrolling.

From 27th January to 28th February ten rank and file, under second-corporal William Roberts, were attached to Lieutenant-Colonel Eyre's column, and during the operations on the march to the Keiskama, and beyond it, were employed in making drifts practicable for waggons, throwing temporary bridges for the passage of the troops, and assisting in the destruction of the enemy's crops.

A similar party during the same period, under corporal George Grubb, accompanied Major Kyle's division to Seyolo's country; and, in addition to the ordinary duties of the camp, assisted in devastating the crops of the Kaffirs, and improved the drifts for the passage of the waggons and the fording of the troops. This detachment also formed part of the waggon escort which conveyed provisions to the column from Fort White.

On the 22nd and 23rd February one sergeant and sixty rank and file were on patrol to Fort White, with supplies for the columns of Colonel Mitchell and Major Kyle. Ten waggons were in charge of the party, five of which were delivered to an escort from Major Kyle's patrol, and the remainder were unloaded at the Fort. The party then returned to King William's Town, capturing on the road two Kaffirs and six horses.

From 5th to 27th March nine rank and file under Captain Robertson, were present in the operations of the force under his

Excellency the Commander-in-Chief, in driving the enemy from the Waterkloof and adjacent fastnesses, and finally from the Amatola mountains. The sappers, commanded by Captain Fenwick, R.E., were most useful in rendering the drifts injured by heavy rains practicable for the passage of waggons. On this service four men of each regiment accompanied the head-quarters as the Commander-in-Chief's escort. The party of sappers also shared in the honour, by being permitted to add five men to his Excellency's body guard. One corporal was also attached to the division under Colonel Eyre, and was present in all its operations from 5th March to 27th April. To this patrol were added seven rank and file on the 20th April, who assisted in the concluding services of the division.

Sixty sappers formed part of a patrol of 150 men, under the command of Captain Moody, R.E., sent out on the 27th March to co-operate with Colonel Eyre's division, and also to intercept fugitives, cattle, &c., flying from him in the direction of the Isili range. That day Captain Moody formed a junction with Colonel Eyre's force under Murray's Kraantz, and in working up by Kaffir tracks to the high ground burnt several of the enemy's huts. The service required that the party should descend again: this was done in a different direction over shelving rocks and through dense underwood. It then crossed one of the sources of the Buffalo, scoured the country in its vicinage, and returned again through the bush under the Buffalo range towards Colonel Eyre's camp. The paths were most intricate and rocky, and the detachment consequently marched in Indian file. While in the heart of the bush night came on. The darkness was so intense that the men were obliged to trail on by feeling and calling to each other. It was with the greatest difficulty that the path was kept, but at last it was lost altogether, and halting near a stream the men lay down on the wet ground, without fires, and passed the night in a comfortless bivouac. At grey light next morning the patrol was in motion, and the sappers emerged from the bush after about four hours' exertion. One man missed his way in the jungle, and spent eighteen hours in endeavouring to gain the

detachment. He had nearly exhausted his energies in extricating himself from the steep and broken rocks that lay in his track, when luckily he was rescued by some of his comrades who were sent in quest of him. After renewed efforts to clear the bush of prowling Kaffirs, and driving them and their cattle in the direction of Colonel Eyre's division, the detachment on the 29th March returned to King William's Town, laying waste on the route three Kaffir gardens. "As usual," wrote Captain Moody, "the sappers behaved in an excellent manner." Their conduct also met with the approval of Colonel Eyre.

With a patrol of about 240 troops, commanded by Captain Robertson, R.E., was sent a party of one sergeant and forty rank and file, under Lieutenant Siborne, R.E. The patrol left King William's Town on the 30th March. The sappers, broken up into small sections, aided in scouring the Isili Berg. On the 1st April the patrol quitted the bivouac at the source of the Yellow Wood river, destroyed a few huts and several fields of corn, and reached head-quarters on the 2nd April.

A patrol of 300 men, under Captain Moody, R.E., conveyed supplies of cattle and provisions to Fort Cox for the divisions working in the Amatolas, and returned with the empty waggons without opposition from the enemy. The escort was out three days, from 5th to 7th April, and 100 sergeants and rank and file of the corps, under Lieutenant Siborne, R.E., formed a part of the force.

Sergeant John Mealey and ten rank and file accompanied, on the 7th April, a small escort under Lieutenant Broke, 60th rifles, with provisions in waggons to the Green river for Colonel Percival's division, and returned the next day to King William's Town.

Soon after this, a detachment of thirty-one men, under Lieutenant Siborne, R.E., built a defensible tower in the Keiskama Hock, for the purpose of making a demonstration of a fixed purpose permanently to eject the Gaika tribe from that territory and to occupy the Amatolas.

The head-quarters of the ninth company was removed from King William's Town on the 28th May by Graham's Town

and Fort Brown to Beaufort, at which fort it arrived on the 19th June. Previously to its arrival it was overtaken in the Konap pass on the 13th June by a body of 200 rebel Hottentots, under Ian Cornelis and Damon Kuhn, and at noon was suddenly brought into action. The small force under Captain H. C. B. Moody, R.E., consisted of two sergeants, thirty-one rank and file, and one bugler, in charge of five waggons containing baggage, arms, engineer stores, and 30,000 rounds of musket-ball ammunition, with four women and ten children. The Pass—a long and dangerous one—has a serpentine direction, accommodating itself to the tortuous ravine through which it ascends. On the left, the whole way is a rocky precipice some forty feet high, scarpd either by manual labour to form a road or by descending torrents in bygone ages, the summit of which is covered with bush. On the right rises a steep hill, inaccessible, and thickly wooded to the brim; a better position adapted to a lurking foe could not well be imagined, affording the means of enfilade fire at every turn of the road.² Acquainted by spies with the movements of the convoy, the rebel Hottentots had before its approach concealed themselves in an impenetrable ambuscade, and as the sappers ascended the hill, the advanced guard was met with a volley which killed three of the mules in the leading waggon and stopped the progress of the train, the road being too narrow to turn it. So sudden and fierce a beginning did not appal the detachment, for instantly, without disorder, they joined issue with the enemy though far superior in force and almost unassailable in position. Some of the party soon tried to push into the bush above them, but the rebels already occupied it close to the edge of the road; and as the thicket was too dense to work in, the men were compelled to retire. At this moment one of the leading drivers showed unmistakeable symptoms of treachery and fraternization with the rebels, and he was instantly shot down by a sapper.³ In a few seconds the firing was general for more than 150 yards on both sides of the Pass, but the detach-

² 'Naval and Military Gazette,' 21st August, 1852.

³ Ibid., September 18, 1852.

ment, careful of its ammunition, only fired when the enemy could be seen and picked off. At length the advance men fell back and took cover under the bank, and between it and the leading waggon, where they received a reinforcement of a few men from the rear. Each waggon was now defended with great determination and intrepidity, and each man fought his way through fearful straits. The firing was chiefly within five yards and less of their antagonists. Sometimes in venturing from their shelter to fire upon the rebels in the kloof, they were opposed by a deadly fire from behind, which always lessened the number that returned. At the head of the road a force of the enemy occupied a position which enfiladed the detachment, but the rebels there were held in check by the steady firing of a few men who kept a vigilant look out for them. Without diminishing his fire in the parts he already occupied, the enemy rapidly increased the extent of his flanks and was trying to surround the little band, but to prevent this, and as the men had been driven to the last stand and were fast falling, Captain Moody gave the reluctant order for the women and children to leave the waggons, and all to commence a retreat. Not a move was made to the rear until the order was given; and, with as many of the wounded as could assist themselves, and the women and children—the retreat towards the old Konap post was conducted with steadiness and without precipitation under a spirited fire from the rebels. On clearing the gorge, a section of the men was extended into the bush to keep the advancing enemy in check, and under its cover the detachment gained an abandoned inn, which was soon converted into a post of defence by barricades and loopholes. Here a final stand was to be made, but the Hottentots, although they were aware of the weakness of the party, dared not renew the attack. The action lasted an hour; three-fourths of the time being spent in defending the waggons, which were riddled with balls. The casualties were—

Killed . . . 7—Lance-corporal John Hitchings; bugler David Brotherston; privates John Crilly, John Gillies, James Marr, Edward Phillips, and William Sanderson.

Also the wife of private Thomas Hayward, and three or four of the drivers, including young Webb, a lad of eighteen years of age, who was shot dead while receiving some caps from a sapper.⁴

Died of wounds . 2—Privates William Forgie and John Arthur.

Wounded severely. 6—Corporal Edward Wilmore; second-corporal William Marshall, and privates Henry Scott, John Cloggie, Philip Gould, and James Reynolds.

Wounded slightly . 1—Private Thomas Seaman.

Total . 16

The enemy, though ensconced in the thicket, had many killed.⁵ All the spare arms, Minié rifles, ammunition, oxen, baggage, and equipments were captured by the rebels, but the waggons, engineer stores, and some minor articles were recovered.⁶ The Minié rifles luckily had been “rendered useless by the precaution of removing the nipples.”⁷

Captain Moody's conduct throughout commanded the confidence of his men. Of their coolness and courage he reported in the highest terms. Colour-sergeant Alexander Spalding who commanded the rear-guard, and sergeant William King, who had charge of the advance, were favourably noticed in the Captain's despatch. Sergeant John Davis of the 12th regiment, was also highly spoken of, as well for his coolness and courage, as for his offer to proceed with four volunteer sappers to Fort Brown for assistance. While Captain Moody was assisting the

⁴ ‘Naval and Military Gazette,’ September 18, 1852.

⁵ King's ‘Campaigning in Kaffirland,’ 2nd edit., p. 237.

⁶ After this disaster, arms or ammunition were forbidden to be conveyed from one post to another, except by the express orders of the Major-Generals or officers commanding divisions, who were held responsible that sufficient escorts were provided to defend the convoys.

⁷ King's ‘Campaigning in Kaffirland,’ 2nd edit., p. 237.

men in their charges, one of the rebels took a steady aim at him by resting his gun on the branch of a tree, but his piece snapped, and before he could re-cap he was shot down by private John Murphy.⁸ Three times sergeant King collected his men, and bravely headed them in their fruitless charges on the rebels.⁹ Private Thomas Hayward volunteered to go to Fort Brown alone, in disguise, after dusk for assistance, but the firing having been heard at that fort, a detachment of the 12th regiment soon appeared, and rendered the hazardous enterprise of the private unnecessary. The arrival of the reinforcement, however, put the men again on their mettle, and Captain Moody and his sappers returned with the party to the scene of the disaster. On both sides of the road they scoured the jungle, but the rebels had decamped with as much booty as they could carry off.¹⁰ "The little band of sappers," wrote a London journal, "were noble fellows, who often before, under another of their officers, had fought bravely in a fairer field."¹¹ In the Government notice of the Commander-in-Chief, dated June 16th, 1852, the conduct of the men "in defending the waggons to the last," and their "steady and good order in retreat after inflicting a severe loss on the enemy," were much lauded. The notice then added, that "the greatest credit is due to Captain Moody and his small party of sappers for their soldier-like and gallant bearing on the occasion." Even the rebel Hottentots themselves in speaking of the massacre said, that "the sappers fought like men."¹²

⁸ Said to be young Webb, a driver (in 'Naval and Military Gazette,' August 21, 1852); but Captain Moody has recorded, that the service was performed by private Murphy.

⁹ The praise due to him was unjustly given both in the colonial and metropolitan press to sergeant Davis, of the 12th regiment: but it was claimed for sergeant King, in a very soldier-like manner, by corporal Wilmore of the party, who was present and wounded in the action. Without attempting to disparage the conduct of the sergeant of the 12th, the corporal explained that at the period the charges took place, sergeant Davis was in the rear at the Old Post, with four volunteer sappers, awaiting orders to proceed to Fort Brown for a military reinforcement.—'Graham's Town Journal,' October 23, 1852.

¹⁰ King's 'Campaigning in Kaffirland,' 2nd edit., p. 237.

¹¹ 'Naval and Military Gazette,' August 21, 1852.

¹² 'Graham's Town Journal,' October 22, 1853.

The remnant of the party, taking with it the killed and wounded, and the women and children, reached Fort Brown at dusk on the 14th June. There the brave men who lost their lives were interred. A subscription was forthwith made among the officers, non-commissioned officers, and men of the royal artillery and 12th regiment to meet the urgent wants of the party, and the necessities of the motherless children of private Hayward. A further sum of 100*l.* was collected among the benevolent citizens of Graham's Town for the same purpose, and the amount was distributed to the sufferers in proportion to their losses and wants.

A visit to the fatal spot a day or two after afforded unmistakable evidence of the obstinate nature of the conflict. Dead horses, oxen and mules, shot in the fray, blocked up the road. Two of the Hottentots lay stanced in their blood, and wells of gore were scattered about the path in sickening frequency. Two waggons, speckled with shot-holes, had been overturned; and further on, in the line of retreat, were strewn quantities of torn uniform, broken muskets, blood-stained linen, and commissariat supplies¹³

Captain Moody, having under him thirteen rank and file, was out on patrol with the force under General the Honourable George Cathcart, from the 6th to 15th July. The sappers kept with the guns. They carried with them a proportion of tools to improve the roads, and assisted in some of the operations for driving the enemy from the Kroome range and the Waterkloof.

On the 25th July sergeant John Mealey and nine men of the corps at Fort White were present with about 100 men of the 12th Lancers, 2nd Queens, and Cape Corps in repulsing an attack on the cattle guard. The Hottentots, about 200 in number, under Uithaelder were on the plain in front of the fort in good skirmishing order. After crossing a drift they stood for a time, and kept up a smart fire on the garrison. They then retreated with the loss of six men to Slambie Kop, to the foot of which they were pursued. The British casualties only

¹³ King's 'Campaigning in Kaffirland,' 2nd edit., p. 236.

counted two slightly wounded. The sappers turned out with great promptitude, not waiting to cover themselves with their jackets, and conducted themselves as good soldiers. Captain Robertson, R.E., was also present, and two of the sappers were near to him in the hottest of the fire. The rebels had a bugler among them who was proficient in his duty. The bugle on which he sounded had been captured by the Hottentots in the Konap Pass a month before from bugler Brotherston, who was killed in the action.

Again Captain Moody, in command of twenty-eight rank and file of the corps, was attached to the troops under his Excellency, which operated from the 29th July to the 29th August across the Kei, by Aland's Post and Whittlesea. On the 6th August the party was increased by the arrival of nine men at Broms Neck, with the patrol from King William's Town under Lieutenant-Colonel Mitchell. This party brought up the India-rubber pontoons, but the low state of the tides rendered their use unnecessary. The detachment more immediately with Captain Moody was employed on the journey in repairing the defective drifts, and establishing a defensible kraal on the Kei at the standing camp. The conduct of the sappers was well spoken of by the Captain, and his Excellency expressed his satisfaction with all that had been done by them.

A detachment of twenty-seven non-commissioned officers and men landed at the Cape from England on the 11th September, which increased the corps in the colony from 268 to 285 of all ranks.

Eight rank and file left Fort Beaufort, under Captain Moody, on the 11th September, and were attached to the division under his Excellency, to make a demonstration in the Waterkloof. At Nelle's Farm, under the direction of Captain Jessé, R.E., they constructed an intrenched camp, assisted by the rifle brigade, and formed a similar one in the valley of the Waterkloof near Brown's Farm. These services were rapidly and creditably executed.

Four rank and file were present in the field services of the column under Colonel Eyre, from 30th September to 30th

October. Four also served in the various operations with Major-General York's division from the 12th to 28th October.

To the expedition against Moshesh commanded by his Excellency Lieutenant-General the Honourable George Cathcart, were attached, on the 7th November, serjeant Joseph Ireland and 13 privates of the corps under Lieutenant Siborne of the engineers. In the column of route, the sappers marched in front of the leading waggon, which carried the intrenching tools; and on several occasions preceded the force, clearing away impediments in the drifts to prevent delay in the progress of the troops. Lieutenant Siborne, aided by Lieutenant Smith of the Kat river levy, directed the sappers in these hurried interstitial labours.

Streams and rivers abounding in the country, the India-rubber floats were necessarily resorted to, to push on the army. The first water of any magnitude on the line of march, was the Orange River, which, having sunk to an accessible depth, the troops breasted it; but to free them from hazard in crossing, their arms, appointments, knapsacks, and personal war equipment were ferried over on the raft by the party of sappers.

Traversing an open country for about 34 miles the army reached the Caledon, which offered the first serious obstruction to the march. The troops luckily had passed on foot, but by the time the waggons arrived the river had risen fifteen feet. Now the current was fierce, surging, and full of eddies; and the trunks of old trees, which, for years, perhaps, had floated with the changing tide, up and down the stream, materially interfered with the operations of the pontoon; but it nevertheless was made to do its work, and the waggons with the supplies were rapidly passed to the opposite bank.¹⁴ Captain Tylden and Lieutenants Stanton and Siborne—the last in charge of the raft—were thanked for their “aid and exertions” in effecting the passage.

A journey of more than seventy miles brought the expedition to the Lieuw—a narrow fordable water, with a dashing tide confined within steep banks. Before however the waggons

¹⁴ King's 'Campaigning in Kaffrland,' 2nd edit., p. 361.

could cross, both shores had to be cut away to a convenient level by the whole force of sappers assisted by a fatigue party. Still, so difficult was the passage, that five hours were spent in taking over about one-half the train; and then only by the sturdy exertions of a double team of oxen whipped into extra activity by rows of persevering men occupying positions in the river up to their waists in water.¹⁵

Continuing the march, the Caledon River—which swept round from the level in which it was first encountered—was a second time approached, but as the stream was fordable, the operation of crossing was unattended by the exercise of more than ordinary energy. The troops then moved on to the Berea mountain and fought a battle with the well-equipped horsemen of Moshesh, in which the British casualties were severe. Corporal Edward A. Henderson was the only sapper present in the action, he being at the time with the rocket section of artillery, attached to Dr. Fasson, the Ordnance surgeon, in the capacity of medical orderly. The pontoneers were left in camp at the Caledon with the raft.

Having made the chief aware of the political consequences of his defeat, and obtained his subscription to a treaty, the victorious troops retraced their steps to the colony. The Caledon was easily passed, and after a march of about fifty miles, the Licuw was gained. Recollecting the difficulty of the previous operation, Colonel Eyre ordered that some efforts should be employed to discover a really practicable drift. A few of the waggons crossed at the old ford, but in the mean time sergeant Ireland—a man who had received praise for his boat services and usefulness in the demolition of the wreck of the ‘Royal George’—discovered a diagonal drift so convenient, as to render the passage one of maximum facility. The bottom was rocky the whole distance, with a shallow flow tripling over the stones; while the general stream escaped through fissures and cavities in the rock, and merged into the river at the other side of the bar. The trickling, however, at the drift, caused it to be very slippery, but to make the footing sure, the defect

¹⁵ King’s ‘Campaigning in Kaffirland,’ 2nd edit., p. 309.

was remedied by scattering along its surface a quantity of sand, which brought the new ford into favour, and the old one was abandoned.

Crossing the Caledon, a second time, without difficulty, the march was sustained to the Orange River. Its passage, however, was a tedious and protracted operation. The rains had increased the height of the stream, and expanded it to 225 yards. The current was resistless and the weather squally. A heavy flat-bottomed punt and the India-rubber cylinders were the only means within reach to achieve the movement. Such an organization, to throw over an army of some strength with guns and troops of horses, attended by a cumbersome train of waggons of unusual magnitude for number was ridiculously small. Five sappers with Lieutenant Siborne manned the raft, and a like number of the troops oared the punt, each working its course, from bank to bank, on a separate hawser stretched across the stream. Thirty-five men, armed and fully accoutred, were taken over at each trip and landed every ten minutes. Indeed the passage across only occupied a third of the time, owing to a skilful use of sheaves—instead of thimbles and eyes—running on the warps, to which short lines were attached issuing from the raft. The latter again was placed obliquely to the warp, by which one of the angles or shoulders of the float was pressed forward to the hawser. All this is probably too technical to be generally understood. The current just suited the arrangement, and lashing against the cylinders—which were broadside to it—drove the raft onward at a rapid rate. Not needing to help in its propulsion, the men, looking to their equilibrium, simply balanced themselves on the deck. Until sergeant Ireland hit upon this expedient, the iron thimbles worked but idly on the rough hawsers, and the raft was necessarily hauled across by the manual dexterity of the pontoneers. Horses, mules, oxen, howitzers, guns, and all sorts of military equipment were passed over on the pontoons; whilst the punt, which could only bear one waggon at a time, and one or two struggling horses, was in constant requisition to take over the baggage and material of the army. Fortunately the evenings were moonlight, which

graced the operation with a charm that influenced the ardour and exertions of the men. Under this sombre aspect, the rush of the stream, the splash of the wave, the dip of the paddles, and the gliding of the raft, gave the exploit a feature as romantic as martial. On two or three occasions the hawsers stretched to their utmost tension, by the increasing height of the river, snapt at their weakest points. To renew them was a labour of some eight hours' toil; and then, such was the strength of the flow, they could not be safely used. The pontoons too, being light and inflated, danced like corks on the troubled water, and were nearly torn at times from under their superstructure. Still, the men accustomed to such perils were only the more daring and energetic, and the passage was prosecuted without accident. Under the altered circumstances of wind and current, the punt would have lain idle for the want of a tow-line by which to work its way from side to side, but Lieutenant Siborne, enlarging his sphere of action, had the boat pulled down on either bank to a good offing and made to do its share of hard duty. It was however a wearying and exhausting process, for each trip was not performed under three-quarters of an hour.

The conveyance of the "sick waggon" claimed especial care, but untoward mishaps made its short career eventful. When about half way across, one of its sweeps or long oars broke, and the boat with its living freight was at the mercy of the impetuous torrent. Drifting with the current it at length plunged among some willow trees below the landing-place, where a rope, passed from tree to tree, being quickly fastened to the punt, a party on shore hauled it to an opening in the bank. The hawser, however, unable to bear the strain, gave way, and the boat whirled off furiously towards a rapid in the middle of the stream. Recovered again, it was pulled up to the trees with so much force, that the overhanging branches became entangled with the waggon and nearly capsized it into the river. In this dilemma, some four or five sappers, under the direction of Lieutenant Stanton, nimbly vaulted into the willows, and with axes, promptly cut down the impeding

branches, whilst others of the pontoneers, "swimming about in the boiling flood," assisted to clear them away. All the obstacles being thus removed, the punt was successfully pulled to the sand-drift, and biding a prudent opportunity, was safely passed to the other bank.¹⁶

No less than eight days were consumed in this exciting operation, and the detachment, which had been left behind its division, to complete some necessary details, were now in full route for head-quarters. By forced marches, in forty-eight hours it overtook the column under Colonel Eyre, which had taken five days to travel the same distance. The subsequent rivers in the journey, being as shallow as rivulets, were easily forded, and no necessity occurred for employing the resources which the sappers had at command. The detachment arrived at King William's Town on the 29th January. Four other sappers despatched from Bloom fontein and attached to the division under Colonel Napier, were also engaged as pontoneers, and completed the concluding operations for crossing the column. On arriving at Graham's Town they joined a detachment of the corps there.¹⁷ On the following muster parade, a letter was read, in which his Excellency commended the zeal and activity of the sappers as displayed in the passage of the Orange river by the divisions under Colonels Eyre and Napier, and justly attributed the success of the manoeuvre to the able manner in which it had been conducted by Lieutenant Siborne.

Lieutenant-Colonel Cole, the commanding royal engineer, in his final report, dated 1st March, 1853, to Brigade-Major Walpole, communicating the termination of the war, thus wrote of the services and conduct of the corps:—"I cannot conclude what is probably my last report to you, without conveying the gratification I have experienced throughout by the value which has been attached to the services of the non-commissioned officers and men of the royal sappers and miners, not only in public dispatches, but from the opinion expressed to me by the

¹⁶ King's 'Campaigning in Kaffirland,' 2nd edit., p. 328.

¹⁷ Much of the information afforded of the expedition is gleaned from an official report by Lieutenant Siborne, and the "Order Book" of the d. c. h. a. t.

late commander of the forces especially, and the officers under whose command they have served, and who have in many instances shown their confidence practically.

“ I am enabled to add that from the reports I have received and my own observation, the non-commissioned officers and men have in all instances throughout this arduous struggle shown a zeal and determination to further the service in which they were engaged, and have displayed their usual gallantry and discipline whenever they have been in the presence of the enemy.”

1853.

Expedition to Central Africa—Private E. Swenny—Journey to Beni-Olid—Hospitality of the natives at Sokna—Black Mountains—Privations and exertions—Private John Maguire—Gatrone—Sufferings of the slaves in their march across the desert—Evidences of the number that perish—Trials of the expedition; halts at Kouku—Party with the department of Practical Art—Sanitary survey of Woolwich—Detachment for survey of Van Diemen's Land—Additional commissions to the corps—Company at Alderney—Corporal James S. Taylor at New York—Company recalled from the Cape—Company to the Mauritius—Party to Melbourne—Inconvenience of its popularity—Epidemic at Bermuda—Detachment for the Mint at Sydney—Greatcoats.

CORPORAL JAMES F. CHURCH and private Edward Swenny, energetic and intelligent men, were appointed on the 19th February to join the expedition to Central Africa under Dr. Barth. The former was a carpenter, and the latter a surveyor and draughtsman acquainted with the management of philosophical instruments, and had, previously to his enlistment, travelled in Belgium, France, Algiers, and Milan. From political considerations they quitted in the character of civilians, but were armed each with a Colt's revolver, a rifle, a double-barrel fowling-piece, a bowie knife, and an axe.

On the 20th February they embarked at Southampton, under Dr. Vogel, a young German astronomer attached to the expedition, and after a short stay on shore at Malta, proceeded to Tripoli, where they tarried for some months, devoting their leisure to learning the Arabic dialect, and familiarizing themselves with the mode of riding on camel-back. Corporal Church also mastered the use of the sextant, mountain barometer, azimuth compass, &c., so as to make ready observations with them.

From a dangerous illness private Swenny could not go on with the expedition, and was sent to England with high testimonials for zeal and ability from Dr. Vogel and Colonel Herman, the Tripoline consul. The ill chance which deprived the enterprise of his valuable services was much regretted by Lord Clarendon, who granted the invalid in addition to his salary a gratuity of 15*l*. His place was supplied by private John Maguire, a fine soldier and skilful mechanic, who was selected from among thirty-six volunteers of the company of the corps at Malta.

The caravan under Dr. Vogel was a large one of thirty-seven camels, carrying upwards of four tons of baggage and presents for the sultan of Bornou and other chiefs. The organization of the force, with the packing and distribution of the baggage, was chiefly confided to corporal Church, who in consequence of the temporary indisposition of Dr. Vogel set out in charge of the expedition on the 19th June, in company with Mr. F. Warrington, a gentleman well known in Tripoli, to Beni-olid, where he arrived on the 26th. There Dr. Vogel joined on the 2nd July, and a day or two afterwards the caravan was again in motion.

At Sokna, midway between Tripoli and Moorzuk, a number of the natives approached them with greeting, and conducted them to an ample residence already prepared for their accommodation. A supply of provisions, consisting of melons, green figs, dates, two sheep, two large dishes of bazeen, and three dishes of some other compound, owning a name more curious than intelligible, was placed at their disposal. In the evening a similar presentation was made to them, and the like extravagant proofs of generosity were continued to the travellers for four days more. Presents were made in return to compensate for this hospitality; but the natives would only accept a few specimens of English cutlery in the shape of knives and razors. On quitting Sokna the governor and the people accompanied the caravan a short distance on the road, and took their leave of the adventurers with unequivocal demonstrations of sympathy and good will.

Next day the expedition entered the pass of Gible Asswaa, or Black Mountains, a region of dreariness and desolation. In every direction masses of basalt seemed to have been upheaved by some convulsion of nature, whilst in some places the rock had all the semblance of iron suddenly cooled after leaving the furnace. Much of the road was of the worst character for travelling, for it was not only hard and broken, but ridged with knife-like edges, which gashed the camels' feet and lamed them. This sterile region extended for more than fifty miles without even a shrub or an insect to invite observation. To add to their trials, the travellers were four days and a-half without water save that carried by the camels, which from being constantly acted upon by the sun was always more than tepid and lost much of its relish. In these mountains the heat was excessive. When exposed to the full blaze of the sun the mercury in the thermometer rushed up speedily to 150° ; and afterwards, when corporal Church withdrew the instrument from the sand in which he had buried it about six inches deep, the indication was 130° . After passing the Black Mountains, the corporal counted in one day nine skeletons of camels which had fallen in the waste from exhaustion.

The expedition now traversed a far-spreading plain, and being short of water, pushed on night and day by long marches for the well called Omhul-obid, or the Mother of Slaves. Before gaining it, they were wearied with sixty-six hours' exertion in the saddle out of eighty, and the camel which Church had ridden from Tripoli, fell dead at Erfad from fatigue.

In a few days afterwards—5th August, 1853—the expedition reached Moorzuk, where private Maguire joined it on the 31st of the same month. This soldier, cool and confident, journeyed from Tripoli with three or four Arabs who were unable to speak a word of English. He was equally unable to exchange with them a word of Arabic. Gesture and grimace, therefore, were the means employed by him to communicate his orders and to express his feelings of satisfaction or discontent; but notwithstanding this impediment, he gallantly drove on,

and in thirty-four days accomplished the journey under a fierce sun, without casualty and with credit.

On the 16th October the adventurers left Moorzuk, and had a toilsome journey as far as Gatrone, where they arrived on the 24th of the same month. Seven days Dr. Vogel and his sappers remained at this place to await the arrival of the rest of the lagging camels and stores. In that time they were joined by a caravan of merchants with about fourteen Arabs from Egypt, going to Bornou to purchase slaves.

While at Gatrone a batch of more than 700 slaves, nearly all women and children, passed through the place. The grown-up men in the drove did not seem to exceed twenty in number. All were in a miserably withered state, and many were panting and dying from fatigue and want. Already they had been driven across a desert between 600 and 700 miles, and had yet to go to Tripoli, nearly 700 miles more. Every step of the journey was to be tramped, and most of them had burdens to bear on their heads, of from fifteen to twenty pounds or more in weight, according to their strength. The slave-masters were very cruel to the wretched creatures, for, if they showed signs of lassitude or fell exhausted on the sand, the whip was applied with unmeasured severity to their naked bodies; and if the horrid scourging failed to move them on, they were abandoned to their fate, perhaps three days from the next well, to perish from raging thirst.

The expedition reached Teghery on the 3rd November, and resting for a few days, after collecting dates for the use of the camels, moved on the 7th into the Great Desert. In the first three days no less than 250 skeletons of slaves were passed, and fragments of bones were scattered about in such vast numbers on the route, that one could traverse the wilderness unguided, without much chance of missing the track. At the wells of Meshroo, about two days' journey from Teghery, the ground had the appearance of an excavated cemetery, or the site of a well-contested battle; and to be free from these sickening relics of mortality, the doctor and his sappers pitched their tents for the night at a distance.

The travelling was carried on at the rate of twelve or thirteen hours a-day, without halting, which was equal to a journey of from twenty-five to thirty miles. This was reckoned to be very fair work, as camels usually only go over two miles and a half of ground in an hour. The average heat of the sun ranged from 125° to 130° , and beamed upon the wayfarers with so oppressive an intensity that their substance and their strength were wasted in excessive perspiration. In the evening they halted, spread canvas, and lay down for the night. The two sappers posted themselves in turn as sentries over the caravan, to protect it from injury or surprise. During the night, owing to the state of the atmosphere falling from its fiery day heat to a temperature sometimes as low as 45° , the men suffered from a feeling of extreme cold.

In this way the expedition journeyed for sixteen days without seeing a single native. For ten marches of the period they looked in vain for the slightest trace of herbage, but at a Waddy called Ekaba, a not very luxuriant oasis, they found a little coarse grass that afforded an acceptable change to the camels after feeding for ten days upon dry dates. On the 27th November the expedition was at Ashanumra, in the country of the tribes of Tibboo.

In due time the expedition reached Kouka where it remained for a while, as Dr. Barth had gone on to Timbuctoo. The return of the chief being uncertain Dr. Vogel explored the country in the vicinity of the lake, taking with him corporal Maguire. Corporal Church was left to carry on the meteorological observations. Contrary to expectation, Dr. Barth, who had been reported dead, returned to Kouka, and soon after, corporal Church accompanied him home. Whatever services may since have been conducted by Dr. Vogel—of which no account has been communicated to the corps, it is proper, nevertheless, to record to the credit of the corporal the very kind terms in which, under date the 4th December, 1855, the doctor wrote of him to the Consul-General at Tripoli:—

“I beg to recommend to your special notice my faithful companion John Maguire, royal sappers and miners, who has,

notwithstanding a serious indisposition under which he suffered in the beginning of our journey, used every exertion to promote the object of the expedition, and behaved in the most praiseworthy manner." For his services corporal Church received a gift of 15*l.* from the foreign minister and a silver watch from the Royal Geographical Society.

The small party under Captain Owen, R.E., at Marlborough House, was increased in February to five rank and file. On the completion of the referential arrangement of the correspondence and documents connected with the Great Exhibition, they were attached in May to the department of practical science and art, under the superintendence of Mr. Henry Cole. Since the transfer they have been engaged in services of a very miscellaneous character, embracing the distribution to national and public schools of examples and models for teaching elementary knowledge, form, and colour, mounting and tinting examples and prints, preparing models, &c., and officiating as clerks and draughtsmen in the offices at Marlborough House. Corporal Mack, in addition to his ordinary duties, produced two or three plans of an interesting character. In arranging some dietary tables Dr. Lyon Playfair engaged the assistance of the corporal. The ingredients used as food, extending to twenty-three substances, having been subjected by the professor to analysis, required to be classified into a simple and consistent arrangement. This the corporal effected by means of an ingenious diagram in colours. Dr. Playfair was well pleased with the illustration, and when at a meeting of the Royal Society, to which the corporal had the honour of being invited, the professor announced his intention of publishing it for the use of schools, the promise was received with applause. True to his intention, Professor Playfair afterwards produced the plan in colours on a very large scale, and gave it a distribution as wide as the United Kingdom. On the 8th June, 1853, the diagram was exhibited at the Mansion-house, and attracted much attention. A reduced plan of the illustration was also made for the Dean of Hereford, which forms the frontispiece to the sixth edition of his work on 'Secular Edu-

cation.' Corporal Mack constructed another elementary diagram, commencing with the diet of an agricultural labourer and *ascending* to that of a convict. Singular to add, by this scale it appears that good diet is increased in the same ratio as crime; and the industrious husbandman fares worse than the felon!

Corporal Gardner, with an assistant sapper, had charge of the decorative furniture of cabinetry, silk tapestry, and drawings, exhibited at Gore House. He received the various specimens, assisted to arrange them, and was intrusted with the responsible duty of securing their safety. On his removal to the royal mint, to receive instructions in the process of coining, he was succeeded by second-corporal John Pendered, who retained the charge of the cabinetry until the close of the exhibition in September, 1853. He also had the care of Gore House estate and the adjoining grounds, purchased by the Royal Commissioners. Second-corporal Frederick Key, the foreman of carpenters at Marlborough and Gore Houses, superintended the construction of the fitments for the exhibition of cabinetry, and the necessary repairs to the interior of Gore House. The working pay of the party, in addition to their regimental allowances, was 2s. each a-day, but corporal Pendered was allowed 3s. a-day, in consideration of the extra charge confided to him in the care of Gore House estate.

On the 15th February was commenced the sanitary survey of Woolwich for the Local Board of Health by corporal James Macdonald, having under him a small variable party of sappers and civil assistants. The survey comprised that part of Woolwich lying south of the river Thames, and was finished in October, the work having been delayed for a few months by the withdrawal of the party for the military survey of Chobham. Corporal Macdonald was provided with outline tracings from the 5-feet initial plan of the metropolitan survey, enlarged to ten feet to a mile. These he carefully corrected, and filled in the details, embodying such other minutiae as were necessary to assist the local authorities in effecting improvements in the drainage, &c. The whole work, so credit-

able to corporal Macdonald, mapped on about twenty full sheets, was done at the expense of the Woolwich Board of Health for 450*l*.

Under the authority of a royal warrant dated 24th February, a detachment of one sergeant, two corporals, and twelve privates was raised for the survey of Van Diemen's Land, which brought the establishment of the corps to a force of 2,200 officers and men. In anticipation of this sanction, the party had been organized and sent to Hobart Town in 1852.

On the 1st April two Quartermasters were added to the corps by the Master-General—Lord Raglan. One was attached to the royal engineer establishment at Chatham, and the other to the companies employed on the ordnance survey. Major Walpole originated the former, Lieutenant-Colonel Hall the latter, and Sir John Burgoyne, the inspector-general of fortifications, ably supported the suggestions by his recommendation. These commissions were bestowed to reward merit, and to place the corps on an equal footing of advantage with the royal artillery, which regiment, taking its published force at the time as a datum, gave one commission from the ranks for every 700 men.

The eleventh company was removed from Alderney to Woolwich on the 2nd June, owing to the diminished strength of the corps there and at Chatham, rendering the withdrawal expedient. For twelve months it had been stationed on the island, and during that period its services were confined principally to the construction of the Longy lines and to scarping the rock in front of them, with the view of making the place less accessible to invasion. The masons always had full employment, but the greater part of the company, failing work at their own trades, took service in the quarries, and furnished the stones for the fortifications. Private Simon Williams was noticed as the best and most successful cutter and builder. On the removal of the company, a small party was left for special duties as foremen and clerks.

An incident occurred in July which from its novelty is deserving of record. Private William Calder committed forgery

and theft, and deserted from the corps. His movements being traced and his assumed name discovered, second-corporal James S. Taylor, fully acquainted with his delinquencies, was sent to the United States, provided with a warrant from the Foreign Secretary, to demand, under the Convention, the apprehension and extradition of the culprit. He had embarked at a Scottish port on board the 'Dirigo,' and as she was sailing up to New York, corporal Taylor, who had arrived in a steamer before her, boarded the trader, captured the thief, and found in his possession all the property he had stolen from his comrades and the Ordnance. The case was taken before Judge Edmonds—notable for his eccentric decisions—and, contrary to the clearest evidence, he discharged the offender, and insinuated, from some extraordinary reasoning he employed, that the corporal himself had committed the forgery. Protesting against the inference, with soldier-like forbearance and respect, he induced the judge to make a promise to cancel his unjust remarks, but his Honour, regardless of his word, afterwards published them without modification. The unmerited accusation, however, did not discourage the corporal from following up his duty; and he made two other attempts to secure the person of the deserter, by asking a remand until direct evidence could be adduced from England, but the partisan judge, proof against proof, ordered the unconditional dismissal of the thief, and thus afforded an asylum to a fugitive, whose character is a reflection on the verdict that shielded him from justice. The exemplary conduct of second-corporal Taylor, eulogized by Sir John Burgoyne and Lord Raglan, gained for him promotion to the rank of corporal. 'The Albion,' a New York Paper, of 3rd September, 1853, gave a spirited leader in vindication of the "soldierly honour" of the corporal; and added, that he "gave his testimony with an air and tone manly, direct, and irreproachable." On the other hand, the forensic turpitude of Judge Edmonds was strongly condemned, for treating the prisoner as the victim of government persecution instead of a renegade charged with heinous and multiplied crime. The prompt measures taken in the case were intended not merely to punish the offender but to

deter others of the corps intrusted with responsibility, money, and property, from the commission of similar offences; and though it failed to secure the delinquent, it opened up for future guidance a sure line of proceeding, which it is hoped there may never be occasion to resort to.

Soon after the close of the Kaffir war the ninth company was withdrawn from the Cape, and landed at Woolwich the 19th September. During its service in the colony, its casualties in action were ten men killed and eleven wounded.

On the representation of Lieutenant-Colonel Waters, commanding royal engineer at the Mauritius, a company was detached from head-quarters in May, which disembarked there on the 25th September. On landing, the fine appearance of the men, their size and soldierlike bearing, attracted the attention of the staff officers and officers of the garrison. In the afternoon they were entertained with a substantial repast, furnished by the spontaneous generosity of the company of royal artillery there. On the following day they were inspected by Major-General Sutherland, who complimented Colonel Waters by observing, "that they were the finest company of soldiers he had for a long time seen." A testimony like this from the Major-General, who is known not to be satisfied with even mediocrity, was certainly flattering.

A party of three men embarked under Captain A. P. G. Ross, R.E., for the colony of Victoria, landed at Melbourne on the 14th October. Selected as they were with reference to their qualifications as mechanics and general intelligence, they had been appointed to oversee the skill and labour employed in the construction of works for the defence of the harbour, and the rapidly-increasing towns in its vicinity. The defence of the bay by the contemplated fortifications was reported by the Captain to be impracticable, and the party awaited for a time the decision of the provisional government on the point. Meanwhile the sappers were efficiently employed in carrying out some subordinate details connected with the Melbourne Exhibition. It was also proposed by the Harbour commission that works should at once be commenced for the extension of

the wharfage on the river Yarra, to give importance and vitality to the shipping and commercial aspects of the colony. Tenders were even called for to carry out the work, but, difficult to satisfy the antagonistic views of a capricious legislature, the suggestion was indefinitely postponed. Thereupon the Captain and his three sappers returned to England, arriving at Woolwich in the summer of 1855.¹

The yellow fever, so frequently the scourge of the Bermuda islands was prevalent at St. George's from August to November, and carried off its victims in greater numbers than in the fatal epidemics of 1819 and 1843. It commenced among the convicts in the 'Thames' hulk, and spread with frightful rapidity, first to the military and civil establishments, and then to the residences of the native population. The first soldier who died was a sapper, and before the sickness had ceased, no less than twenty-five men of the corps, out of a detachment of forty-seven of all ranks, became its victims. Three women and one child of the party also died. Colonel Phillpotts, the commanding royal engineer, and Lieutenant Greatorex, R.E., were among the dead, as also the wife of Lieutenant Whitmore, R.E. All the men of the detachment except three were attacked with the fever, and many suffered relapses. To relieve them as much as possible from the influence of infection, they were early removed from their quarters to an encampment on the north side of the island, near the naval tanks, and finally to Prospect Hill and Port's Island. "Those who were able," reports Captain White, R.E., "showed themselves to great advantage by the cheerful way in which they attended to the sick. Their exertions were above all praise." Several opinions have been ventured relative to the exciting cause

¹ The sappers were very popular with the good people of Melbourne. Wherever their red-coats were seen, all sorts of inconvenient invitations followed. He must have been more than Bacchus to have accepted a tithe of their overflowing attentions. Luckily the men were impreguably temperate. To escape from the extravagant compliments of the citizens, Captain Ross, on the representation of corporal Goodear, permitted his sappers to appear in plain clothes. They were thus lost among the people, and saved from the friendly annoyances to which their bright uniform had honourably exposed them.

of the epidemic, but the general belief was, that from some disturbance in the position of the hulk by the pressure of strong winds and agitated tides, the atmosphere became impregnated with mephitic gases emitted from the accumulation of impurities around her bottom. Ireland Island, where a half company of sappers was stationed, was not visited by the calamity.

A warrant dated 15th of August, sanctioned the formation of a detachment of one sergeant, one corporal, three second-corporals and eleven privates, for service in the mint at New South Wales, which increased the corps to a total of 2,218 of all ranks. To fit them for the duty, they were quartered for several months within the royal mint, near the Tower, where the departments of the establishment were thrown open for their instruction. From a desire to monopolize the craft of the mintage to themselves and their families, the moneyers viewed the employment of the sappers in this confidential work with jealousy and opposition, and just imparted to their military pupils as much knowledge of the art as they cared to divulge. The party, however, made up by attention and observation for what was withheld from them, and promptly acquired full information with respect to the working of the machinery, and the various processes used in coining. Two or three of the smiths were also initiated in the method of adjusting weights and scales, and in the construction of balances and patent locks and safes. Instruction in these mechanical expedients was given them by Mr. Hobbs, celebrated for his exploits in picking locks before considered invulnerable. The first instalment of the detachment, consisting of sergeant Archibald Garduer and nine rank and file, embarked at the London Docks on board the 'Maid of Judah,' on the 3rd of December, 1853, and landed at Sydney in March, 1854.

The grey greatcoat, which for nearly half a century had been worn by the corps without improvement, was in November of this year superseded by a blue cloth greatcoat of the same cut and fashion as its predecessor, except that the cuffs for all ranks were abolished, the capes diminished, and the sergeants' collars were of scarlet, instead of blue cloth.

1853.

CHOBHAM CAMP.

Nature of the ground—Position of the sappers—Their strength—Quarters and cantonments—Equipment—Duties and services—The survey—Marking out the encampment—Forming tanks—Wells—Lakes—Construction of stables—Camp-kitchen—Oven—Incidental employments; Royal pavilion; Queen's road—Sentry-boxes—Post-office and postal statistics—Intrenchments—Submarine mining—Passage of Virginia Water—Her Majesty's gracious acknowledgments of the conduct of the sappers in the operation—The second passage of the lake—Also of the Thames at Runnymede—Field-days—Inspections by the Queen—Breaking up the camp—Satisfaction of Colonel Vicars and Lord Seaton.

IN common with the army, the royal sappers and miners furnished detachments for the camp at Chobham about four miles from Chertsey. The common where the encampment was formed was an extensive tract of waste, varied with hill and dale. The amplitude of the district, its freedom from enclosures, from wood or bush, or from barriers or hedges to mark the boundaries of individual or corporate properties, and its succession of swelling heights, well adapted it for the purposes of an instructional encampment, and for the campaigning evolutions of a concentrated force, assembled less for military parade and display than to realize in degree some of the chequered difficulties and vicissitudes which fill up the hard and comfortless career of an army engaged in the active operations of war.

The camp was established on the concave edge of the ridge. Each end was advanced, while the centre with a sweep receded, giving to the position a curved line approaching the segment of a circle. The detachment of sappers was tented south of the 'Magnet,' the name given to the hill where the head-quarters were established, and next to the left of the Coldstream guards, close to the road leading across the common to Bæshot. The

line regiments which succeeded, fell back from the detachment. To be regimentally correct, the sappers should have been on the right of the Grenadier guards, but the position was chosen for the corps because it was central, prominent, and easily accessible to the troops requiring the use of entrenching tools and field implements. The division, consisting of a due proportion of cavalry, artillery and infantry, was under the orders of Lieutenant-General Lord Seaton, G.C.B. The sappers were among the first troops on the ground. At soon as it was determined to form the camp, the party at Sandhurst—one sergeant and twelve rank and file—was directed to suspend its services at the college, and remove to the encamping district. It commenced work on the 21st of April and ceased on the 7th of May, when it returned to the royal military college to carry out the concluding operations of the term. Lieut. Drake, R.E., commanded this party.

To make a hurried survey of the ground one sergeant and eighteen rank and file were detached from Southampton between the 27th of April and the first of May, who, as the service permitted, returned in sections to the ordnance survey. A small party detained at Windlesham for special purposes, in connexion with the military survey, did not quit the district till late in July. Lieutenant Stofherd, R.E., directed the detachment.

Colour-sergeant Henry Brown and twenty rank and file from Chatham, reached the encamping ground on the 9th of May. On the 13th following, this detachment was increased to a company (numbered the 2nd) of three sergeants and eighty-seven rank and file from the royal engineer establishment, under the command of Captain Lovell, R.E. Lieutenant and Adjutant Somerset from Woolwich, joined the company on the 14th of June. The whole were under the orders of Lieutenant-Colonel Vicars, R.E.

To diversify the operations, a pontoon train was ordered to be attached to the division; and on the 20th of June, the sappers appointed for this duty commenced to move in detachments. The force consisted of drafts from the first, fifth, and

eleventh companies detached from Chatham, and reached a total of

1 quartermaster—George Allan,
1 sergeant-major—William Read,
12 sergeants,
16 corporals,
3 buglers, and
156 privates.

189 Total

under the command of Colonel Harry D. Jones, assisted by Captains H. St. George Ord, G. Ross, and W. M. Inglis, and ten subalterns of the royal engineers. The great bulk of the men arrived at Wellington camp on the 22nd of June, on which date the totals of the combined force of sappers counted 297 of all ranks.

A day or two after the pontoon operations at Virginia Water were concluded, the first company, with a detachment of the eleventh, quitted Wellington camp, and returned to Chatham the same day.

The second company at Chobham camp was relieved on the 22nd of July by the fifth company, with the greater part of the eleventh from the Wellington camp, and repaired that day to Chatham. The company was played from the ground by the band of the 79th Highlanders, who, from good feeling, volunteered to confer the honour; and as it passed the tents of the 79th three cheers from the assembled regiment testified its esteem and friendship for the departing company.¹ The total force then left for the field duties of the camp, exclusive of the surveyors, numbered 100 men of all ranks.

As some further pontoon operations were ordered to be executed, and the force at the camp was considered to be numerically inadequate for the duty, sixty-five non-commissioned officers and men were sent to the field from Chatham on the 25th of July, and after the completion of the work, they returned on the 28th to their destination.

The party from Sandhurst and colour-sergeant Brown's de-

¹ *'Morning Chronicle,'* June 27, 1853

tachment were billeted at Sunning-hill and Sunning-dale. On Captain Lovell arriving with his company at Shrub's-hill, finding no billets or tents he stayed for three days in a barn at Bagshot Park House. On the 16th of May the company was for the first time tented on the skirts of Colonel Challoner's wood, then on Sheep's-hill, and lastly on the Oystershell-hill near the "Magnet." The division under Lord Seaton reached the encampment on the 14th of June, when in allusion to the appearance and exertions of the troops as they took up their ground, a leading journal of the day observed, "that the sappers and miners, probably the most intelligent and best-educated men in our army, make the least external show."² The pontoon train was encamped about one and a half miles from Virginia Water, near the Wellington Bridge, from which the camp took its name. The detachment of sixty-five men furnished to assist in the formation of the bridge across the Thames at Runnymede, was billeted during its short stay at Egham.

The camp equipment for the Chobham company embraced five marquees, fourteen circular tents, one hospital tent for officers' mess, one for orderly room, one guard tent, and one store and ammunition tent, besides fourteen Flanders' kettles. For the pontoon train there were four marquees, thirty-four circular tents, two hospital tents for workshops and stores, one laboratory tent, and twenty-five camp kettles. Each man was supplied with a wooden canteen, havresack and blanket, but no bedding. Straw was afforded in abundance to sleep on. The men were distributed in parties of nine and ten to each tent, which permitted the senior non-commissioned officers to be provided with ample canvas accommodation, and some spare tents to be used for various incidental military purposes.

A detail of the duties and services performed by the sappers and miners in connexion with the encampment follows. In some of them they were assisted by small levies from the guards and the line. The senior non-commissioned officers were colour-sergeants Henry Brown, Noah Deary, and Timothy Sillifant, who throughout the service were indefatigable in their exertions,

² 'The Times,' June 15, 1853.

and their skill and contrivances were on many occasions found very useful.³ In the early stage of the preparations, Viscount Hardinge inspected the camp on Sheep's-hill, and expressed in a few pointed sentences his satisfaction of the appearance of the field, and the steps taken to render the accommodation of the troops as comfortable as the resources of the district would admit.

It was deemed indispensable that a map should be provided of the country for several miles round the encampment, to guide the Generals in the choice of positions, manœuvres, marches, &c. The district had been surveyed sixty years before, in common with the general survey of the south of England, and was drawn on a scale of two inches to a mile. The better to meet the present requirement, the plans were enlarged and drawn to a scale of four inches to a mile. All the improvements which had arisen within the last half century were also supplied, and the original work corrected where necessary. This was done by taking magnetic bearings with a prismatic compass and pacing the ground. The distance examined and corrected, included an area of about 220 square miles, the cardinal angles of which were Chertsey, Wokingham, Farnham, and Guildford. All was carried out and completed between the 1st May and 14th June. The principal part of the hills were sketched by Lieutenant Stotherd, assisted by four non-commissioned officers of the corps, who, although heretofore wholly employed in the operations of a civil survey, were, without any previous practice in the art, made to turn their talents to account in military sketching. The survey—comprised on four large sheets—was compiled, lithographed,

³ Sergeant Brown has served twice in Gibraltar and also a campaign in Syria. He was present at the capture of Tyre, Sidon, and Beirut, and the defensive occupation of D'Junie and Jaffa. Has since gained credit for his services at the capture and destruction of Bomarsund and the siege of Sebastopol. Removed in a dangerous state of illness from the trenches, he was sent to the hospital at Smyrna, from which, being invalided, he arrived at Woolwich in July, 1855, and is now quartermaster-sergeant at Chatham.

Sergeant Sillifant distinguished himself at Gibraltar as a first-class artificer and foreman of works. Has since served at Bermuda, and returned to England on the recall of his company.

and coloured under the direction of Captain W. D. Gosset, R.E. Corporal Sinnett drew the 12-inch plan of the encampment furnished for the use of Colonel Vicars. A special survey of the ground at Aldershot Heath was also made and plotted on a scale of six inches to a mile, by sergeant Spencer and corporal Macdonald. The soldiers most conspicuous for their usefulness in the Chobham survey were—

Sergeant Benjamin Keen Spencer; for surveying, levelling, and hill sketching.

Corporal William Jenkins; trigonometrical observations, levelling, and traversing.

Second-corporal James Macdonald; traversing and surveying.

Lance-corporals John Erskine Daveran and Valentine Sinnett; hill sketching, surveying, &c.

Marking out the encampment was done by the sappers under Colonel Torrens, assistant quartermaster-general, by driving pickets into the ground in the places selected to mark the salient points of the boundaries, to be occupied by the several regiments.

The springs and watercourses were sought for and collected into small reservoirs or basins, at sites as convenient for access as practicable. In some places small trenches were excavated, to afford easy channels for conveying the water to the terraces. These tanks were for domestic uses. Attached to them were larger ones for washing purposes, which were filled by the surplus water from the drinking reservoirs through the agency of small troughs, fixed near the top of the partitioned embankments.

From the dipping and trawling of so many utensils of different kinds into the tanks, and the constant washing of the water against the sides of the embankments, it became very dirty and disagreeable. To obviate this, pumps were fixed in the tanks, large wooden troughs being added to them to convey the water to the recipients, and sentries being posted over the reservoirs to compel all parties to take the water from the approved contrivances instead of resorting to the objectionable mode which had been attended with so much discomfort.

Where springs could not be found in sufficient number, wells

were sunk to afford water for the troops. Some of these answered excellently, and yielded a good supply. In several instances the men were interrupted in the service by the presence of moving quicksand, which prevented them digging to the depth they otherwise would have done. These wells, nevertheless, were ultimately made available for use. To keep the ground from being undermined by the sand, rough sap rollers were at first constructed and sunk, but as these were found inadequate to meet the difficulty, on account of the sand oozing through the interstices of the brushwood, some barrels were securely fixed at the bottom, which at once offered an effectual resistance to any encroachment, and secured a serviceable quantity of good clean water. Into several of the wells two or three bushels of pebbles and shells were thrown to purify the water in its infiltration. Wells cased or lined with fir poles—an expedient first resorted to—were found not to answer, as the water collected in them tasted disagreeably of an impregnation of turpentine. Many failures in seeking for water occurred. Three or four in elevated parts of the field were sunk through a stratum of sand and clay to the depth of thirty-five feet without success. Two artesian wells were also bored late in July, one to a depth of sixty feet and the other to thirty-five feet, without any beneficial result.

Tradition or experience was of little avail in selecting places to sink the wells with anything like certainty of finding water. Nor were any men present who possessed the occult and mysterious faculty of using the divining rod to discover it. Several ingenious suggestions were made and acted on with no better result. All depended upon chance; and to make up for the deficiency from this source, greater attention was paid to gathering the nests of springs, and opening up courses and channels for their unfettered issue into reservoirs. Commonly, depths beyond thirty feet were obtained without the use of the windlass, or the application of materials to support the sides. Many of the sappers in these experiments turned out expert well-diggers, and executed the heavy duty with energy and coolness.

The formation of lakes was effected by damming up some small brooks and rivulets, in the valleys which emptied themselves into Virginia Water. The dams were raised on piles formed from the ends of fir poles, which, to make a firm foundation, were driven into the ground about ten or fifteen feet wider at the base than the road was at the top. The sides were built with good sods, and filled in with the best soil that could be gathered on the spot. Where the bog was unstable, it was replaced by stiff clay, which was puddled. In this way two or three fine expansive sheets of water were formed, which were extremely useful for the cavalry horses; and a safe and ready passage was also afforded for the troops across some valleys and morasses over the roadway of the dam. One sheet was behind the cavalry stabling on Egham Common, and the others, named "The Great Arm" and "The Little Arm," were at the base of Black-hill and of Sheep's-hill.

The stables were constructed of a uniform width, but the length varied according to circumstances. For a stable of six horses, the dimensions were twenty-seven feet by thirteen feet six inches. The uprights or stanchions were nine feet long, three feet of which were driven into the ground and well rammed. A wall-plate was then fixed to the stanchions at the height of six feet from the ground. The rafters were made of rough poles, secured by a collar-beam four feet from the top, and then nailed firmly down on the wall-plates, every alternate one being strapped with hoop-iron. The centre was supported by a king-post rammed three feet into the ground, and besides being nailed to the collar-beam, was tied for steadiness and stability at the top with rope-yarn. Poles were also fixed and secured on either side and at the ends, which, with the doors, were thatched or wickered with fir branches, compactly intertwined. The whole was roofed with canvas, and stayed by guy-ropes. The canvas was made under contract, in pieces to cover a stable for six horses, but after a few days' rain the pieces shrunk about sixteen inches, and caused throughout the period of the camp much inconvenience to the horses. The stabling was made to accommodate 1,800 horses at an expense of nearly

1,000*l*. An experimental stable of the above form was run up in two hours and a quarter by twelve men, under sergeant George Pringle, directed by Lieutenant Drake, in the presence of the Commander-in-Chief—Viscount Hardinge—who expressed his satisfaction both with the exertions of the men and the suitability of the construction.

The camp-kitchen for the sappers was built six feet wide and ten feet long, and was approached by a ramp. The flues were ten feet long and one foot wide, with a space intervening through the entire length of twenty inches, which was six inches deep in front and lessened to nothing as it neared the neck of the chimney, for the purpose of facilitating the action of the air and producing a rapid draught. Its sides were built up with sods to the height of fourteen inches, and the top was covered over with the blades of broken shovels. Intervals of nine inches were left to receive the camp-kettles. A trench was dug round the kitchen from which at one end rose, to the height of above six feet, a mud stack containing two distinct chimneys shaped into ornamental pots. At the other end, the two fires were lighted. The flues were kept independently of each other, and, with the chimney-stack, were plastered both inside and out with clay. This expedient gave to the kitchen a neat appearance, and sufficient durability to stand the wear and tear of constant use. Sometimes it was converted into an oven by removing the kettles, and temporarily closing the open spaces with sods. The kitchen cooked for 100 men. Though somewhat troublesome to inexperienced men to construct, compared with the old Peninsular *range* adopted by some regiments in camp, it was a decided improvement both in form and utility, inasmuch as it economised fuel, received with readiness the few appliances used in military cooking, and enabled the culinary art to be carried on with more alacrity and on a larger scale.

An oven was also constructed after the model of the kitchen with one flue and chimney only. It was built with bricks made on the spot, from clay in the vicinity of the camp. Amid so much rusticity and so many rude campaigning inventions,

this oven, from its neatness and success, was much admired. Sergeant Timothy Sillifant, an ingenious mechanic, designed both the kitchen and the oven, and superintended their construction.

Some incidental services executed by the sappers were of a character which it may not be considered inappropriate to notice. So various were their duties and so frequent the calls for their assistance, that the encomiums passed upon them after a full test of their usefulness were not extravagant when it was said "that in all their capacities, from the driving of a nail to the marking out of a fortification, they seemed to be equally as *au fait* as if each service was their special and sole vocation."⁴ They repaired and adapted the poor-house at Burrow Hill for a general hospital; erected a flag-staff for displaying the royal standard; enclosed a large area of ground with a canvas wall seven feet high, within which were pitched marquees and different tented conveniences for the use of the Queen and Her Majesty's Consort and guests; and watched and managed the tent-ropes of the royal pavilion, &c., within the compound. Here likewise they erected a cookhouse of brick, after the form of their own kitchen, and cut a road about two miles long, from Colonel Challoner's plantation to the "Magnet," as a carriage drive for Her Majesty. The road led across one of the artificial sheets of water, and at either side of this causeway was fixed a temporary railing, which gave it an appearance of strength and completeness. Contrivances were also adopted for permitting the water to run freely through the embankment so as to insure the stream rising to the same level at both sides of the bridge. The road was, moreover, a useful one, for in manœuvring the troops it was sometimes employed to accelerate their movements, and the passage across it formed a grand feature in the reviews. It was called the "Queen's Road," and the dam across the sheet of water was dignified with the name of the "Queen's Bridge." The sappers also attended to the pitching and adjusting of the marquees of some of the staff officers; drained the camp ground; taught soldiers of the

⁴ 'Morning Herald,' July 19, 1853.

line the readiest methods of effecting these duties, and built several sentry-boxes. One was erected under the superintendence of a French captain, of rough poles driven into the ground in a circle, after the manner of the initial gabion. In front, one stake was omitted for the entrance. The box was built to the usual height, was covered in with a conical top, and the whole was thatched with straw in courses, which gave it in the distance, when the sun was shining upon it, the semblance of a richly-flounced dress. Another box of this kind revolved on a pivot at pleasure, to screen the sentry from wind or rain; and after the camp was broken up, it was given a place in the grounds of Colonel Challoner. A third was run up by private James Queen,⁵ which, from its mechanical pretensions, was applauded as a work of taste, but could never be successfully imitated unless by talented workmen accustomed to build with neatness and exactness. The structure was of a mural character and defensible, having loopholes in its sides and rear. An heroic bust, made of clay by the private, who had shown some aptitude as a sculptor, was to have surmounted the box, but it was unfortunately destroyed by some of his comrades, during an excited criticism upon its merits.

"Much as we admired," wrote a London daily journal, "the universal utility of the corps, we thought we had seen the extent of their capacities, but when looking a little more into the variety of their employment we found them in a new sphere, and discovered that corporal Richard J. Letton had been, under Mr. Smith, discharging the details connected with the Post-office with the usual off-hand success which seems to pertain to the corps."⁶ The receiving-office⁷ at the "Magnet," was a sub one to the post at Chertsey. The number of letters sent to and from the camp, as detailed below, from the first day of opening the office to the day of closing it on the removal of the troops, shows that it transacted a fair amount of business.

⁵ Killed in the trenches before Sebastopol by a rifle-bullet, April 18, 1855.

⁶ "Morning Herald," July 19, 1853.

First division—from 13th June to 13th July.

Inwards	33,783
Outwards	29,614
	<hr/> 63,397

Second division—from 14th July to 20th August.

Inwards	42,105
Outwards	37,500
	<hr/> 79,605

Total 143,002

Of these the number of registered letters were 257, and the postage-stamps sold realized the sum of 123*l.* 17*s.* 3*d.* The number of letters to the camp showed but little variation through the course of the month, but those despatched *from* it were much affected by the field days, and on one occasion they fell from 1,526 to 601. The management of the postal arrangements was highly satisfactory, and reflected great credit upon Mr. Smith and the corporal.⁷ The latter, in a testimonial from his chief, was eulogized for having performed his duty with the greatest zeal, integrity, and attention.

To give an additional warlike feature to the evolutions of the division, some temporary field-works were thrown up. These consisted of three redoubts, two irregular, with faces of very unequal length, on Oystershell and Catton hills, and one regular, on Sheep's-hill. The one on Oystershell-hill was revetted on one of its faces with brushwood and fir-branches woven upon pickets, while its remaining sides were cased with sods. The other redoubts were revetted wholly with sods. Sheep's-hill redoubt was a square work, with two platforms for one field-piece each, and its sides in the interior were each sixty feet long. Four shafts of six feet deep were sunk under its right face, and the charges, in boxes containing each 100 lbs. of gunpowder, were laid and tamped ready for explosion on the

⁷ 'Morning Herald,' July 19, 1853. It is not a little strange that among the unclaimed letters was one addressed to "His Eminence Cardinal Antonelli, Secretary to His Holiness the Pope." The correct epithets of distinction in the superscription, made it evident that the missive was written by a well-informed person. As however the Cardinal had not pitched his tent among our troops, the letter which was directed "to be left till called for," formed one of the spoils of the camp.

6th August. The Queen was present on that day and witnessed the manoeuvres, which were closed by blowing up the redoubt. At the appointed time, the wires were applied to the voltaic battery, but from some mismanagement, supposed from the communication becoming disconnected, the mines did not go off. Two sappers immediately repaired to the spot where the charges were chambered, and after removing the earth which covered them, and affixing in the ordinary way the powder-hose to form the train, Captain Inglis fired it with portfire, and a successful explosion was the result. The whole face was blown up. The field-works were completed early in August, and were only on three or four occasions used in the general operations. Contingents of men from the guards and the line threw them up. Some of the sappers acted as overseers, and others took part in the trenches. The shafts for the mines were dug and the powder placed in them in the night-time.

A series of seven or eight sub-aqueous mines, fired by voltaic electricity, were made in Virginia Water, to show the effect of such expedients if the service rendered recourse to them desirable. The largest charge fired contained 35 lbs. of powder. The charges were fixed in tin cans of sizes to suit the bulk of the powder, and fired from the shore. Sergeant Entwistle and one private had the preparation of the charges, &c., and Captain Inglis, R.E., invariably fired them. One on the 12th July was exploded in the presence of the Prince of Wales, and was successful, a column of water being thrown into the air to a considerable height.

As soon as the pontoon train and equipment arrived, the corps commenced and continued for several days to carry out such instructional practice as was considered essential to render the contemplated bridging perfect. The train consisted of—

- 30 cylindrical pontoons,
- 4 india-rubber ditto,
- 1 demi india-rubber ditto,
- 6 carriages,

and the requisite stores, forge, &c., and all were packed on the margin of Virginia Water on the 25th June, 1853.

In accordance with appointed arrangements, a military display took place on the 5th July, in the presence of Prince Albert and Her Majesty. Early in the morning about 8,000 troops were marched to the Water, on the north side of which an enemy was supposed to have established himself, represented by the second company of sappers and detachments of the Grenadier guards and 23rd fusiliers. While a sharp and prolonged attack was being made upon the brigade of Sir De Lacy Evans at Blacknest Bridge, a body of sappers 125 strong, directed by a captain and five subalterns of royal engineers, began to form the pontoon bridge, and to carry out other subsidiary means for effecting the passage of the lake. The six carriages of the train, packed with twelve pontoons and their superstructure, were horsed by the royal artillery, and moved down to the water's edge, where they were unloaded. The remaining pontoons, eighteen in number, had already been stored on the margin of the lake in readiness for the service. The moment the order was given, the sappers in fatigue-dress launched the pontoons, and with the greatest silence, precision, and diligence, formed in forty-five minutes a bridge of thirty cylinders with two bays across an arm of the lake 324 feet broad. The pontoons were lashed in intermediate intervals of eight feet apart, which is considered to be the proper adjustment of buoyancy for the transport of the varied weights of artillery. While the bridge was booming out, Her Majesty and His Royal Highness Prince Albert, with their illustrious guests, embarked in a royally-decorated barge, drew near the bridge and watched with evident interest the movements and exertions of the men.

During the operation a party of twenty-one non-commissioned officers and men, under three subalterns of the royal engineers, formed two rafts and one demi-raft of the India-rubber pontoons, and rapidly ferried across the lake four companies of the rifle brigade, who took shelter in the woods close to the edge of the water. This service was executed in exactly the same time that was occupied in forming the bridge.

About noon, the cannonade on the left at Blacknest Bridge ceased, and the supposed enemy, having discovered Lord Sea-

ton's real intention, advanced to dispute his passage over the pontoons. Not a moment was now lost on either side. One wing of the rifles was thrown across, and forming line on the opposite bank, opened a spirited fire on their opponents. The batteries also boomed from the south side of the water, and under cover of the cannonade—for the whole woodland for some minutes was shrouded in the smoke it occasioned—a battalion of the Grenadier guards defiled over the bridge. Scarcely had they concealed themselves in the embowering woods when the sappers, who had left the pontoons for an interstitial duty, suddenly returned with bundles of fern and brake, which they strewed over the superstructure to render the passage as secure as practicable for the batteries and the cavalry. Now followed two 6-pounder batteries and a 9-pounder battery of 6 guns each, the 6th Dragoon guards, and a battalion of the Coldstream guards and of the 42nd Highlanders, with all the staff.

The remainder of Major-General Fane's brigade of cavalry proceeded by the iron gate to the high ground on the north side of the lake, whilst the brigade of Sir De Lacy Evans, now unopposed by the enemy, marched by Blacknest Bridge to Smith's lawn, where the troops were reviewed by Her Majesty. The second company only of the corps was present at the review; the other companies being necessarily detained with the pontoons.

To provide as much as possible for the safety of the horses in crossing, the sappers, with an oar extended from man to man, lined the bridge at each side, by which a kind of railing or balustrade was formed from one end of the bridge to the other. The plan had unquestionable advantages in encouraging the horses and retaining them in their places, but it was somewhat dangerous to the men. As the second battery approached the middle of the stream, the floating motion of the bridge caused some of the horses to become restive, and in the efforts made to control their progress, five of the sappers were thrown into the lake. No casualty, however, happened, and the men, after a little swimming, resumed their stations on the bridge.

In testimony of the services of the corps on this occasion, Lord Seaton published the following order from Her Majesty :—

“ Horse Guards, 5th July, 1853.

“ GENERAL VISCOUNT HARDINGE has received the Queen’s commands to express Her Majesty’s satisfaction in having witnessed this day the laying down of the cylindrical pontoon bridge, which was completed in less than one hour, for the passage of the artillery, cavalry, and infantry.

“ Her Majesty did not fail to remark the order, the silence, and the perfect acquaintance with every detail, which prevailed throughout all ranks of the sappers and miners.

“ Her Majesty highly appreciates the service of this portion of her army.

“ From the date of its original formation this corps has been remarkable in the annals of the British army for the scientific attainments of its officers and the practical knowledge of its men, and has justly acquired the confidence and esteem of the army by its skilful arrangements, and by being at all times foremost in the perilous duties of war. In peace upholding its high reputation by the useful labours which it so cheerfully performs.

“ Viscount Hardinge requests Lord Seaton will convey to Colonel Jones, of the Royal Engineers, who directed the pontoon train, and to Colonel Vicars, in charge of the engineer duties in the camp, and to the officers and men of all ranks of the Royal Sappers and Miners, the Queen’s approbation of their state of discipline and conduct.

“ By command of General Viscount Hardinge.

“ (Signed) G. BROWN, A. G.”

The 11th July was another day of field manœuvring appointed expressly to experimentalize with the pontoons. Before the arrival of the troops at the lake, a bridge was quickly formed with twenty-four pontoons, on the same site as that occupied on the 5th instant, and by the same detachment. At eleven o’clock a part of the division under Major-General His Royal Highness the Duke of Cambridge passed over it in the order of movement detailed below :—

4 companies of the 93rd Highlanders,
13th Light Dragoons,
6 companies of the 93rd,
38th regiment,
17th Lancers,
1st Life Guards,
1 troop of Royal Horse Artillery—six guns,
2 nine-pounder guns; and
4 small ammunition waggons.

The time occupied in the passage of the troops was fifty minutes, and on its completion, the bridge was speedily broken up into

rafts. These, with the assistance of the India-rubber rafts, manned by the same detachment as on the 5th July, were afterwards employed in ferrying back the 38th and 93rd regiments at a spot 150 yards wide, below where the bridge had been constructed. This duty was also completed in fifty minutes. In all the operations, there appears to have been a remarkable coincidence of duration, which, had the facts not been carefully ascertained and recorded, would seem to be the errors of carelessness or inexperience.

In crossing the bridge, many of the horses of the Life Guards became unmanageable. Not a few of them got into a gallop and started off, sometimes as many as three abreast. Several of the artillery horses also were restive. Among so much violence and disorder, the sappers, who lined the bridge as before, had to bear their full share of accident and danger, and before the passage was effected, as many as twenty-five sergeants and rank and file were thrust overboard. All fortunately could swim, and soon made good their places on their respective rafts.

This day's bridging closed the operations on Virginia Water. With the exception of seven rafts and the six carriages, the remainder of the pontoons and stores were packed up and removed to their original stations at Woolwich and Chatham. The seven rafts, &c., were soon afterwards conveyed to Staines, in readiness for ulterior service over the Thames.

On the 27th July another pontoon bridge was thrown, this time across the Thames, at Runnymede, celebrated alike for its historic claims and attractions, and for the beauty of the surrounding landscape. The point chosen was an angle of the river about a mile from the town of Egham, opposite Ankerwycke House. The operation bore some resemblance to that which took place on Virginia Lake on the 5th July. The sappers commenced their march at eight o'clock in the morning, and, proceeding with the pontoons along the Windsor and Staines roads, halted on the banks of the river at Runnymede at a quarter to eleven. At once the men set to work, and under the more natural circumstances of steep banks and a strong tidal

current, unfelt at Virginia Water, threw in thirty-five minutes a bridge consisting of six rafts of twelve cylindrical pontoons in open order, twelve feet apart, and two half bays. To allow the operation to be conducted without interruption, a mimic battle was fiercely carried on some distance higher up the river, and to afford protection to the bridge as it approached the Ankerwycke shore, parties of the 79th Highlanders were rapidly rowed across in punts, which at the time were lying unemployed and captured for the occasion. Soon the combat was removed to the pontoons, and a heavy fusillade was for a long time kept up. Under cover of the guns of the horse artillery, fired from a commanding position, the troops poured over the bridge in a continuous stream, and followed the retreating enemy, with all the impetuosity of enthusiastic pursuit into Magna Charta Island. There the fight was hotly maintained, and ultimately won by the little band of mixed troops under the command of Lieutenant-Colonel Vicars.

The troops that crossed the bridge were a battalion of the Guards, 4th Light Dragoons, the other battalion of Guards, 79th Highlanders, the Horse Guards Blue, and some batteries of horse and foot artillery.

An accident took place just as the last battery was crossing the bridge. The vertical motion of the rafts was such as to startle the horses, and some, from the dull reverberating noise produced by their tramp, coupled with the booming roll of the heavy wheels on the superstructure, became ungovernable, and six horses tumbled into the stream dragging with them a gun with its carriage and limber. As usual, the sappers lined the bridge with extended oars, and in the struggling of the horses, four of the men were swept into the current. Three of them were injured—two severely. These were privates John Piper and William Swann,⁸ who were also nearly drowned. The latter was entangled with the horses in the water, and it was with great difficulty he succeeded in getting on the back of one

⁸ Served in Turkey, Bulgaria, Wallachia, and the Crimea. Was promoted for his gallantry at the battle of Giurgevo, and died of wounds received in the trenches before Sebastopol, in May, 1855.

of them, when he was picked up by the crew of a boat quickly manned for the purpose. Four of the horses were cleverly rescued by colour-sergeant William Jamieson and private Henry Collins, who dexterously cut the traces; but the two wheel-horses, borne down by the carriage, could not be saved. Privates Daniel Port, Henry Collins,⁹ and Elias Garratt conducted themselves with intrepidity on the occasion by plunging from the bridge into the river to rescue the men and save the horses.

After the operation the sappers bivouacked on the ground, and dined on the day's ration taken with them from the camp. The bridge was afterwards dismantled, packed on the waggons, and then accompanied the troops to Staines. The company belonging to the Chobham force did not reach its tents till eight o'clock in the evening.

On field days the sappers, together with a company of the Guards, on several occasions under Captain the Prince Edward of Saxe Weimar, and a company of the 23rd fusiliers, represented the enemy under the command of Colonel Vicars, R.E. All acted as skirmishers; and when pressed by charges of the troops, formed squares, or resorted to such other simple manœuvres as were best adapted to their position and circum-

⁹ An accident occurred to this soldier at Virginia Lake, which but for his presence of mind was likely to have terminated fatally. The waggons were parked on the slopes of the water, and it being desired to pack the stores on them, private Collins with three other privates rushed to the spot, and put a waggon in motion. Collins laid hold of the shafts,—the others pushed in the rear. By some mistake the men in rear quitted their hold, and the waggon thus left to itself rolled with great velocity down the slope, forcing Collins on with it. His situation was now very critical; but seeing at once the danger and the way to escape, he plunged from between the shafts, in an oblique direction into the lake, and saved himself by swimming, while the waggon with its own impetus dashed onwards, until its speed was spent by the resistance of the water. Had he not thus extricated himself, he would have been tumbled over by the waggon, and most likely drowned under its body. Served afterwards in Turkey, Circassia, Bulgaria, and the Crimea. Was present at the bombardment of Odessa, capture of Redoubt Kaleh, and at the siege of Sebastopol, and bore the character of being a good sapper and a first-rate man in bridge-making and boat services. By his comrades he was respected for his wit and spirit. His constitution giving way in the trenches, he died at Kululee on the 2nd April, 1855.

stances. On these days the expenditure of ammunition by the company was enormous; 100 rounds per man at least were consumed. On the first day of the pontooning at Virginia Water, the sappers, who were posted to prevent the passage of the troops by Blacknest Bridge, fired in an hour and a-quarter about 120 rounds a man. The firing of the main body of the division was always comparatively trifling. From the hard nature of the duties that devolved upon the enemy, the men composing it gained in camp the familiar designation of "The Kaffirs." The last field day at Chobham was one of labour and fatigue to the men. They fired more than an average quantity of ammunition, and at its close the sappers marched at the head of the line in review, before the Duke of Cambridge and Lord Seaton. Their blackened faces, dingy accoutrements, and well-worn apparel afforded a striking contrast to the clean appearance, unsoiled appointments, and bright uniform of the passing squadrons and battalions; and it was no inappropriate commendation to say on this, their last camp inspection, that in their endurance, their hardihood, their wearied but dauntless aspect, they looked like "Polish patriots—few, but undis-mayed."

On the 21st June and 5th July the Queen inspected the second company in common with the rest of the troops at the camp. The Prince Albert and Lord Hardinge accompanied Her Majesty. The King and Queen of Hanover were present on the first day. The fifth company and a detachment of the eleventh were also reviewed by the Queen and the Prince Consort on the 4th and 6th August. On the latter date Her Majesty did not personally inspect the troops. On all occasions of the royal presence at the camp, the sappers were in full notice of Her Majesty, for they possessed the advantage of occupying a position close to the Bagshot road, and next to one of the special entrances, which led the Queen and the royal cortege immediately past their tents to the "Magnet."

After the breaking up of the camp, the sappers remained for four days to dismantle the stables and collect the stores. All the canvas was stripped off the stables, and packed in two days

and a half, throughout which time the men were exposed to a ceaseless rain, which fell in torrents. The pontoons and carriages were conveyed to Chertsey, and embarked for Chatham. After completing these duties, the fifth company and the detachment of the eleventh, under Captain W. M. Inglis and Lieutenant W. C. Anderson, R.E., arrived respectively at Chatham and Woolwich on the 24th August. On that day Lord Seaton finally gave up his command. A party of one sergeant and eight privates—the last troops at the camp—detained for the closing duties of clearing the ground, and collecting and packing the Ordnance and Commissariat stores, joined at head-quarters on the 27th August. Novel and memorable was the reappearance of these companies with the corps, for both officers and men had doffed their plumes, and substituted for them bunches of blooming heather, gathered from the ridges and valleys of the now famous Chobham. On their route to Chertsey they were met by Colonel Vicars, who complimented them for their excellent conduct and exertions during the period of their encampment, and expressed to them the satisfaction of Lord Seaton for their alacrity and readiness at all times to meet the wants of the service. This testimony was afterwards corroborated in a letter dated Hyam's, 25th August, 1853, to Lieutenant-General Sir John Burgoyne, in which his lordship, after alluding to the active assistance of the officers of royal engineers, and the detachment of the corps of sappers under the command of Colonel Vicars, added "that their conduct and exertions on all occasions have been most satisfactory."

1854--1856.

Staff appointments—Party to Melbourne—Mint detachment to Sydney—Survey of Aldershot heath—Department of Practical Science and Art—Staff ranks to the survey companies—Dress—Party detached to Heligoland—Also to Paris for the Exhibition—Corporal Mack's services in testing woods—A foreigner's surprise at the varied employments of the sappers—Sergeant Jenkins' interview with the Emperor—Fire at the *Mauvention du Commerce*—Radical change in the dress—Arms and accoutrements—Costume of the quartermasters—Supernumerary sergeants—Additional staff appointments—Exhibition at the Mauritius—Arrival of company from Bermuda, and removal to Aldershot—Chatham becomes the head quarters—Rejection of the services of Van Diemen's Land detachment by the Legislative Council, which are accepted by the Governor of New South Wales—Organization and pay of driver troop—Additions to the corps and various incidental alterations—Detail of establishment of corps—The band—Its costume—Dress of the bandmaster—Party recalled from Purfleet—Detachment to Hythe for rifle practice, &c.; the system pursued there becomes a leading feature in the instruction at Chatham.

MAJOR WALPOLE, on his promotion to be lieutenant-colonel, was removed from the appointment of brigade-major to the corps, and succeeded by Captain Frederick A. Yorke, R.E., on the 17th February. Lieutenant-Colonel Walpole had been commissioned to the office from the Cape of Good Hope, where he had served for many years in command of the tenth company, and been twice dangerously wounded in action with the Kaffirs at Fort Peddic. During the six years he had held the appointment he carried out in all respects its requirements with a diligence, consideration, and success, that were of great advantage to the corps, and enhanced in public estimation its services and merits.

In Major Yorke, now Lieutenant-Colonel, the corps has the good fortune to have for its chief executive an officer who, for

the greater part of his military career, has been much employed with it both at home and abroad. Under Major-General Matson, when brigade-major, he was the acting-adjutant at head-quarters, and thus early became acquainted with the organization, character, services, and resources of the royal sappers and miners.

On the 3rd March one sergeant and five rank and file sailed from Southampton for Melbourne to reinforce the civil staff employed in the survey of the waste districts of the Crown, and landed on the 24th July. This addition was made to the colonial establishment, as applications for land by the emigrants were increasing and urgent, and could not be met by any resources to be engaged in the colony.

In April a party, huttet on the bleak heath of Aldershot, commenced a series of surveys, having reference to the use of the moor as a military camp for periodical evolution and exercise. The detachment mustered at one time as many as twenty-four non-commissioned officers and men, and dwindled down to an initial party of a few choice hands to finish the operation. Captain Cameron, R.E., had the direction of the service; and corporal James Macdonald, now sergeant, a non-commissioned officer of tried ability and indefatigable activity, was its local superintendent. In ten months the detachment, after being instructed by the corporal, completed a survey of a selected district of about 800 acres for the Commander-in-Chief; another of some 1,500 acres for the professional use of Major-General Sir Frederic Smith; and a general one for the Ordnance, including the ground specially surveyed, extending over an area of 13,000 acres. Each survey provided its contours to suit particular requirements; and the whole range of duties for providing data for the plans, usually performed by different parties, with qualifications adapted to each particular service, were wholly carried out by corporal Macdonald¹ and his party. The work has since been engraved on the 6-inch scale.

¹ Under an officer, he has charge of the preparation of the 10·56 feet plans of Plymouth, Stonehouse, and Devonport, and of the office for the examination of plans and documents antecedent to the engraving of the work.

Six rank and file to complete the mint detachment at Sydney, embarked in two parties on the 8th April and 19th June, taking with them the portable houses, shops, machinery, and stores necessary for the formation of the establishment. The men had all been instructed prior to leaving the royal mint in London in the art of coining, and were taught by Messrs. Walker, of Millwall, the method of fitting together the iron roofing, cisterns, girders, &c., to form the mint buildings. One man had also been instructed by Messrs. Whitworth and Co. at Manchester, in the manipulation and action of the several lathes to be used in the coining processes. They respectively reached Sydney on the 10th July and 24th October.

Three men were withdrawn from the department of science and art in the summer for service in the East, viz., two for employment as photographers, and one—corporal Dickson—as conductor of the pontoon equipment and stores. One of the photographers—corporal Pendered—had, while in that department the care of the students' drawings sent from the various local schools of art, in competition for prizes offered by the commissioners. Corporal Dickson, who until his removal had acted as a clerk at Marlborough House, received from the Board of Trade a gratuity of 5*l.* in recognition of his usefulness. The non-commissioned officers who remained under Captain Owen, R.E., were corporals Frederic Key and James Mack; the former, stated to be full of invention and intelligence, continued throughout the year to act as overseer of the civil carpenters employed at Gore and Marlborough Houses; and the latter, remarkable for his good information and acquirements, was found a most useful clerk and draughtsman. It should also be noted that one or other of these non-commissioned officers travelled during the autumn to several provincial towns in England and Scotland, such as Nottingham, Coventry, Sheffield, Warrington, York, &c., and exhibited to local institutions in connection with the central school of design at Somerset House, a collection of students' drawings for which prizes had been awarded at the spring examination at Gore House. The exhibition was so arranged as to be packed and conveyed from

town to town with readiness and facility, and wherever they itinerated with their charge, were treated with attention and courtesy.

As a reward for undoubted merit two staff ranks—sergeant-major and quartermaster-sergeant—were given to the survey companies on the 28th July by Sir Hew Ross, Lieutenant-General of the Ordnance. Similar appointments had been held by the companies for many years with only modified advantages, but now they were constituted permanent ranks and carried with them all the benefits prescribed by the rules of the service.

This year the moustache, under certain restrictions, was permitted to be worn; and the Kilmarnock bonnet, discarded in 1837, was revived. Its dimensions, however, were of a more reasonable measurement than in olden times, and suitable for campaigning. A yellow band was added, also a plain yellow ornament on the crown, and the scanty peak worn for nearly forty years, was replaced by one familiarly termed the war peak, sufficiently large to offer an efficient shade to the face from the sun.

Leaving the great events which occurred about this period, to be treated without interruption in subsequent chapters, the more ordinary incidents of the corps will first be disposed of.

Unable to obtain British troops to furnish contingents of sufficient magnitude for the East, parliament voted the formation of regiments of foreigners to meet the pressure. Depôts for their enrolment were fixed at different places, but the principal station was at Heligoland, a small rocky island in the North Sea. As however the embodiment could not take place without the means of sheltering the force, the island itself having only accommodation for the native population, Lieutenant A. R. Lempriere of the engineers, with three sapper carpenters, were sent there in March, in the steamer 'Hamburg.' Towards the end of the month the party landed, and with the assistance of some broad-backed women—the men being too indolent to work—the huts brought out were carried up the stairs—a stupendous flight exceeding 200 steps formed in the

face of the steep cliff—to the position where the cantonment was to be established. Hopeless to complete them within the time required, twelve other sappers, mostly carpenters, under sergeant Goodear, sailed from Woolwich on the 28th July. In a few days they were deep in the work. Rows of huts covered with Croggan's asphalted felt, built in streets, were always ready by the time the troops arrived to occupy them. It took one hundred and four of these portable houses to accommodate the legion. Tanks were also built to supply water in case of fire, and an apparatus was erected for distilling sea-water so that it might be used for domestic purposes by the troops. When all these services were completed, the sappers no longer needed in Heligoland were shipped for England, landing at Folkestone on the 29th December. Lieutenant Lempriere remained, as did also sergeant Goodear, to oversee the native workmen in the formation of roads and in executing repairs to the huts. At the conclusion of the war they returned home. The efficiency and usefulness of the party were warmly acknowledged by Colonel Steinbach, commanding the legion.

At the instance of the Royal Society, a sergeant and three rank and file were sent to Paris in April to exhibit, at the Palais de l'Industrie, several specimen maps and some of the chief instruments used in the trigonometrical surveys of the United Kingdom. The two non-commissioned officers employed under the Board of Trade at the department of Practical Science and Art also accompanied Captain Fowke and Mr. Henry Cole, to assist in the British section of the Exhibition. The sappers were—

Sergeant—William Jenkins.

Corporals—Frederick Key and James Maek.

Second-corporal—Nicholas Clabby.

Privates—Ludovico Hart and James Kelly.

Besides arranging spaces for the exhibitors, opening the cases as they arrived, and arranging the articles for exhibition, the sappers turned their hands to a hundred different duties, making themselves generally useful and sustaining the character which the corps had received for its services at the Great Exhibition

of 1851. The British department was surveyed by them and corporals Mack² and Clabby drew the plans. Key was the overseer of skilled labour and likewise superintended the hanging of the paintings at the Palace des Beaux Arts. The remainder had the care of the professional instruments. Of these Hart was instructed at Paris in the process of photography by Mr. Thurston Thompson, and the proficiency he attained there in the art, has introduced him to a similar duty at Southampton, in which the progress he has made promises to be a great saving to the public by reducing plans photographically, and thus superseding the hand-labour of draughtsmen.³

² He also assisted Captain Fowke, R. E., in testing the comparative qualities of various woods, products of New South Wales, British Guiana, and Jamaica, which had been exhibited at the Palais de l'Industrie. "In conducting and registering these experiments," wrote Captain Fowke, "I was assisted by corporal James Mack, of the royal sappers and miners, who displayed the greatest zeal, intelligence, and ability throughout."—"Reports on the Paris Universal Exhibition." Part i. 1856, p. 407.

³ Of the connection of the sappers with a service so interesting, the following anecdote is an illustration. A "foreigner of distinction" paid a visit to the Palais de l'Industrie. With Captain Fowke he rambled over the courts, and while the Captain was explaining to him, among other matters, his experiments on the strength of woods, they reached the spot where corporal Mack, in the Captain's temporary absence, was carrying them on with all the intelligence of a scientific man. A little further on was another sapper. This was sergeant Jenkins, who, for the visitor's information, cleverly expatiated on some philosophical apparatus in his charge. A red-coat in the building was an object of decided attraction, and the foreigner looked with no little satisfaction at corporal Clabby, who was then making a minute and accurate survey of the position of the cases and objects in the Exhibition. He had scarcely withdrawn his attention from the draughtsman, when a fourth sapper in the person of corporal Key, the indefatigable overseer, came in for a share of the foreigner's approbation, and he expressed to Captain Fowke his amazement that so many difficult and important duties could, with such efficient results, be intrusted to them. But the measure of his astonishment was not yet full. There was a magnificent organ, built by Revington and Son, of Greek-street, Soho, in the Palais, which had gained the first-class prize, on which, while the distinguished foreigner was taking his tour, an amateur with a small body and a young and pleasing countenance was performing. Drawn by the power and grandeur of its tones, the Captain and his friend repaired to the compartment where it had a locale, but on turning the corner, instead of finding, as was expected, a "Maestro," or "un professeur anglais," seated before the instrument disporting himself with the hauteur of a musical genius, the foreigner was struck by seeing another sapper, complacently playing with the proficiency and grace of a modest professional. "Mon Dieu!" he cried, as if the varied employments

The Emperor in one of his visits to the Palace examined the maps and instruments, and sergeant Jenkins had the singular distinction of explaining their nature to His Imperial Majesty.⁴

of the British sappers were too exuberant to merit a less startling exclamation, "Encore un sapeur du genie!" And the foreigner went away with a most excited opinion of the talents and attainments of the corps, of which the men above named were the creditable representatives. The military Mozart on this occasion, who strangely enough was named after that "divine composer," was Ludovico Amedius Woolfgang Hart!—a name due less to his English than his German extraction. As young Hart had opportunity, he applied himself to the great organ with its three rows of keys, pedals, and accessory movements, containing also eighteen hundred and eleven pipes and forty-two stops. His performances comprised selections from Handel's Messiah, Haydn's Creation, and other oratorios. Once when Her Majesty was passing through the English department he took his place at the instrument, and made the Palais swell with "God save the Queen;" and on another eventful day, when the Emperor of the French was visiting the Exposition, he struck up the national anthem of France—"Partant pour le Syrie."

⁴ The first time the Emperor visited the portion of the gallery allotted to Great Britain, he condescended to scan the survey contributions. As he approached the compartment, sergeant Jenkins saluted him. In return the Emperor took off his hat and bowed; and, as if to make the sergeant feel perfectly at home in his presence, smiled and seemed in delightful humour. After glancing at the six-inch map of Edinburgh, over which was written in conspicuous letters, "Ordnance survey of Scotland," His Majesty exclaimed, "Ordnance survey of Scotland! but where is the map of England?" Jenkins explained that he had several specimens of the one-inch map of England, and invited the illustrious Monarch to inspect them. "O! certainly;" and His Majesty graciously accompanied the sergeant to the interior of the little court taken up by the survey specimens, where, in a measure, His Majesty was isolated from the crowd, which, with straining curiosity and awe, followed the imperial footsteps. When examining the one-inch map of North Wales, the Emperor traced his finger over the neighbourhood of Snowdon, and observed, "the shading of the hills is beautifully executed." The sergeant then directed the Emperor's attention to the plan of St. Andrews on the five-foot scale—a map very much commended for its finish by all the eminent engineers who had examined it. His Majesty appeared highly pleased with it, and then succeeded a string of questions which the sergeant—a stranger to the parasitical language of the courtier—answered with the honest pertinence and refinement of a man of good common sense. Among the interrogatories was one in which the Emperor enquired,—“Has the whole of England been surveyed on the six-inch scale?” In looking at the great theodolite, the Emperor evinced unequivocal interest; more so, when the sergeant informed him it had been in use above sixty years, and had operated on the summits of the highest mountains and most of the important trigonometrical stations in England, Scotland, and Ireland. Of its action, adjustment, and peculiarities the Emperor asked several questions, and called a scientific attendant, to whom His Majesty explained,

This was the first party of English soldiers that had been in Paris since the army of occupation quitted the suburbs of the French metropolis in 1815. Appearing invariably in the uniform of the corps they were regarded with peculiar interest, and from all quarters were received with a friendliness more than ordinarily debonair and cordial. For their assistance in extinguishing a fire at the *Manutention du Commerce*, the press of Paris handsomely acknowledged their services.⁵ Individuals left for England at different times, and on the return of the last two in January, 1856, the Board of Trade honoured the whole party with presents. Sergeant Jenkins received a silver watch with the most approved compensation arrangements for use in connexion with astronomical observation; Key a gold one; Mack an expensive photographic apparatus; and the other three each a case of beautifully finished mathematical instruments. The gifts bore an inscription to the effect that they were given "for services at the Paris Exhibition, 1855." The French Commissioners also gave them bronze medals.

An agitation which for more than a quarter of a century had exposed the inappropriateness of the old costume, at last succeeded in effecting its abandonment. Involved in the change the royal sappers and miners adopted an uniform under royal

in French, what the sergeant had communicated to him. The Emperor then examined the models of Arthur's seat and the Merrick hills, and also that of the zenith sector, with all of which His Majesty was well satisfied. Surrounded by a vast assembly, with heads uncovered and in breathless admiration of the magnanimity of the incident, thus was passed an interview of about a quarter of an hour, between the Emperor of the French and a British soldier!

⁵ Of the party, Clabby, Hart, and Kelly only were at the fire. They attached themselves to the engine nearest the building; so close was it, that Kelly was struck on the shoulder with a piece of burning timber. At one time the pipe burst, spirting the water over the workmen. One of the Zouaves was up to his knees in water trying to mend the fracture, when corporal Clabby went to his assistance, and taking the handkerchief from his neck bound it round the pipe, and partially removed the annoyance. This little act, so gracefully and promptly performed, met with a shout of applause from the multitude, and before the ringing of the acclamations had subsided, an officer from the Marshal of the "*Garde de Paris*" made a note of their names; with what object, perhaps, the future will tell.

sanction, which has the credit of being the neatest in the service.

Late in the summer the coattee with its double breast, short body, garish trimmings, and narrow skirts gave place to a scarlet single-breasted tunic with facings and edgings of dark blue plush. Falling back with a curve, the collar is bound all round with yellow cord while the pointed cuffs are embellished with an Austrian knot of yellow cord which, stretching over the plush rises with a flowing involution more than seven inches up the sleeve. Plain skirts measuring about twelve inches long, lined with white shalloon, are broken in their plainness by two upright pocket slashes with plush edgings having three points and as many buttons. Double cords take the place of the huge epaulettes of former days, and the buttons unaltered in shape and device, are sewn two inches asunder down the breast as low as the waist, and two smaller ones add to the ornamentation of the cuff. All ranks wear the same description of tunic. That for the drivers is shorter in the skirts for riding.

Corresponding with their grades the sergeants and staff-sergeants have finer cloth and wear royal gold cord on those parts where the rank and file display yellow worsted cord only. Rank is shown by chevrons of gold lace worn above the elbow, but the badges to denote the staff-sergeants occur just above the sleeve knot with the points upward. Lance-corporals have one stripe on the right arm; other ranks have the marks on both arms. Second corporals one on each arm; corporals two; sergeants three and an embroidered crown; colour-sergeants an equal number of chevrons surmounted by an open banner and based by a couple of crossed swords; and the staff-sergeants four badges of broader lace and an embroidered crown. The last, in addition, have facings of garter blue silk velvet, shoulder knots of treble twisted gold cord with blue eyes bearing silver embroidered grenades; sleeve knots traced in and out with Russia gold braid and the skirts lined with white kerseymere. The bugle-major's rank, in addition to the chevrons and crown, is indicated by a musical device with banners, which must have puzzled the professors of embroidery to make it sufficiently

characteristic, elaborated with cross trumpets, rams' horns, tambourines, and other insignia, around a lyre and grenade.

The artificers of the driver troop—farriers, shoeing smiths, wheelers, and collar-makers—are distinguished by the usual devices, worn above the elbow.

The buglers wear worsted embroidered cross trumpets on both arms, and the good conduct men are distinguished by badges of narrow gold lace on the right arm just above the knot.

No better colour for trowsers than dark Oxford mixture cloth could be introduced. They have therefore been retained, as also the red stripes down the outer seams. The working trowsers are of the same colour, and similarly striped, but a few shades coarser in texture. The driver troop wear strapped trowsers of the regimental quality, of which each man receives two pairs annually.

In the midst of a variety of conflicting ideas as to what constitutes the best head-dress, the uncomfortable chaco still holds its unsightly place as a component of sapper uniform. Top-heavy for the drivers in riding, the chaco forms no part of their uniform, and so the forage-cap is made to do double duty.

The fatigue jacket is of red cloth. Loose and suitable for working it descends as low as the hips, but is militarized by blue cloth pointed cuffs, single twisted shoulder-cords of yellow worsted, and a blue cloth rounded collar. As before, the buttons are small and convex, bearing the garter device, and worn about an inch apart, evincing less coxcombry than in the defunct days of close buttons. All the non-commissioned officers wear gold chevrons and gold single twisted shoulder-cords.

Scarlet jackets, after the fashion of the fatigue ones, are worn by all ranks on drill parades and in walking. In addition to their chevrons the sergeants and colour-sergeants wear embroidered crowns, the latter rank being distinguished from the former by a fourth chevron. Besides the plain single-breasted blue surtout, modernized with a rounded collar, the staff-sergeants appear, on parade occasions, in scarlet jackets with

the badge of their rank, gold studs down the front, and dark blue silk velvet cuffs and collar, both trimmed with Russia gold braid, and finished with what the tailors, in the poetry of their trade, term crowsfeet. There are no buttons on the jacket, except two on each cuff and two to sustain the double shoulder-cord. The fronts are closed by hooks and eyes.

The cloth forage-cap—a delicate institution of peaceable times—was set aside by the adoption of a small Kilmarnock bonnet and chin-strap, well suited for the rough usages of war. Worn with a dragoonish air in the day, it offers itself as a substitute for a pillow at night without the fear of spoiling its shape. It is of dark blue wool banded with a yellow stripe manufactured in the web and decorated with a brass boss in the centre of the crown. The buglers wear the distinction of a pair of crossed trumpets on the front of the cap, while the sergeants and staff-sergeants have small dark-blue cloth caps with large projecting peaks, trimmed with scarlet piping and gold lace bands. The crown of the cap, *à la cavalry*, is formed of eight pieces—a curious fancy—radiating from the centre and covered at the point of union with a gold netted convex boss. The band of the staff-sergeants is wider and richer than that of the sergeants.

That important article of dress, “the ammunition boot,” has been much improved in these late days. Before railways were invented the laced-up boot was a favourite among soldiers, particularly those who could boast of having performed long marches in the Peninsula and France; but when travelling by rail began to be the fashion of the service, it was discovered that the laced-up boot was not only odious in regimentals and uncomfortable, but not water-tight. So by degrees the Blucher boot was introduced in the army, and the sappers, the last troops, perhaps, to adopt it, received Bluchers this year for the first time. The troop of drivers wear half Wellingtons.

The carbine introduced in 1843 being discarded, the Lancaster percussion-musket was given to the corps late in the year. Bored elliptically without groove, and carrying an elongated bullet, its range exceeds 1,000 yards: that of the carbine, even

in extravagant instances of flight, scarcely ever struck a mark at 300 yards and was uncertain at 200. After a few rounds had been fired it was inefficient, and impromptu expedients had to be resorted to, when the bore fouled with the powder, to ram the cartridge home. Many a man broke the ranks to find a brickbat or other rude assistance to hammer the ramrod into the barrel. These primitive severities are now at an end. The bayonet can be used in the double capacity of a sword or bayonet. With a hilt partly of black skin cross-pressed, and partly brass, with a transverse brass bar guard, it is fixed to the musket by a suture and spring. The blade, about two feet long, has a rounded back and runs on with a spine to the point, from whence a return stretches with a slight swell up its back, and then loses itself in the spine about ten inches from the tip. Thus the sword for a certain distance is two-edged, and when fixed, the length of the musket, prepared for a charge, is shorter by one inch than the abandoned carbine and sword bayonet.

The accoutrements remain as formerly ; but the appointments of the staff-sergeants, now of white patent buff, consist of a waist-belt with slings and gilt waist-plate bearing the royal arms, and a pouch-belt, both plain and two inches broad. To the latter is attached a black leather pouch carried by gilt rings and mountings, having on the flap the device of the royal arms and supporters with the corps motto. Swords hilted like those of the quartermasters, but of a peculiar metal, sheathed in steel scabbards and tasselled with gold acorns, complete the improvements of this period.

The drivers have no rifles or muskets, but are armed with light Prussian swords having half basket-hilts and buff leather tassels. The gripe is partly of black japanned wood, ridged ; all else, with the scabbard, are steel. The narrow buff waist-belt, with slings which suspend the sword, have a plain brass waist-plate. In addition, the non-commissioned officers have a buff pouch-belt carrying a small plain black leather pouch. The former bears a brass slide at the breast as a substitute for a buckle. All ranks wear swan-necked spurs with spiked rowels.

Of the dress of the quartermasters nothing has yet been recorded in these pages. Their costume is similar to that of the subalterns of engineers, with the exception of the appointments. The tunic harmonizes with that of the staff-sergeants, except that the sleeves bear no device beyond the Austrian knot, and the gold cord is larger.

The jacket is also similar to the staff-sergeants, deviating only by the addition of gold Russian braid down the fronts and round the girth, finished at the centre of the waist and collar seam with crowsfeet.

A waistcoat is also worn of scarlet cloth, single-breasted, with gilt studs crowded down the front. Hooks and eyes serve the place of buttons. Collar, pockets, and edges are trimmed with gold braid and graced with crowsfeet at the centre of the collar, and at each end and centre of the pockets.

A surtout is permitted as a lounging appendage to the costume, but it would require the professional assistance of a Buckmaster to describe without fault the man-millinery of this military frock. It is of dark-blue cloth, single-breasted, opening five inches down the breast to show the waistcoat, up to which from the waist the fronts are closed by hooks and eyes. Eight loops of braid nearly two inches broad, with two rows of netted barrels or olives on each side—two on each loop—descend from the shoulders in lessening lines to the waist. The ends of the loops inwards have flies three inches long which fall down like tags, covering the inner row of barrels. The front edges, rolling collar, and pointed cuffs, hind arm and back seams are trimmed with braid seven-eighths of an inch broad traced in and out and finished on the cuffs and centre of collar with crowsfeet. From the back seams flow two streamers eight inches long on each skirt of the same width of braid as that which covers the seams; and the tracing on both edges terminates in two crowsfeet. All the trimming and traceries are of mohair braid.

The trowsers are the same as the uniform of the corps, but with gold lace stripes one inch and three-quarters wide for dress occasions. The cloak is of blue cloth, riding length, with

sleeves. Lined with scarlet shalloon, and amassed with a cape, make it waterproof in a storm. An upright collar of scarlet cloth with gilt fuming grenades, chains, hooks, and buttons, make up the sum of its ornaments.

Every non-commissioned officer, as he ascends the weary ladder of preferment, keeps his eye steadily on the cocked-hat. It would therefore be unpardonable to omit the description of a badge which has given rise to more ambition in the ordnance corps than can possibly be satisfied. It is the *only* commission open to them, and the struggle to gain it is far more difficult than for born gentlemen to attain the rank of General. If life be spared this comes as a matter of course, but only one in thousands can hope to be invested with the latter. The cocked-hat then is a small one compared with the Kelvenhuller, and though as confined in its dimensions as the Ramilies, is very unlike it. It seems to be a sort of compromise between the two. The right leaf stands six inches and three-quarters high, while the fan, its fellow leaf, tops it by nearly an inch. The former bears a cockade of black watered ribbon and a gold-laced loop two inches broad, which is stayed by a regimental button. The corners or shoots are nearly five inches long and two and a half broad, bearing tassels of small gold and crimson bullion affixed to gold netted pads which lie snugly in the recesses formed by the overlapping of the fan. The ribbon worn on the sides of the left leaf is of plain black silk. Surmounting all is the plume, five inches and a half long, made of cock-tail feathers, which fall over the crown of the hat in the shape of a mushroom.

The forage-cap is assimilated to that worn by the staff-sergeants; the gold-laced band being broader and richer.

Coming to the appointments, they consist of waist and pouch belts of white patent leather, respectively one inch and a half and two inches wide, the former having narrow slings, gilt buckles, rings, and waist-plate with the corps' device in silver, and the latter a gilt engraved buckle and mountings to correspond with the hilt of the sword. These ornaments are worn on a fly of the belt just above the pouch, which is small, of

black patent leather, bearing the regimental badge of the royal arms and supporters with the corps' motto, and attached to the belt by rings issuing from gilt leaves. The sword is thirty-two inches and a half long by one inch and a half wide. Its gripe, of black fish-skin, is ribbed with treble gold wire, sustained by a plain gilt back, the lower half grated to assist the grasp. The hilt is of the half-basket kind, formed of rolled gilt metal, scrolled, pierced, and engine-turned, embellished with a gold acorn attached to a length of royal gold cord, which after rami-fying the perforations, evolves in a tassel. To complete the details, let it be added, that the scabbard which sheathes the blade—proof against any amount of hard work and figured with military insignia—is of burnished steel.

Some important augmentations had been made to the corps, which will be found among the services out of which they in great part arose. Other desirable additions followed, which, belonging more to the incidents of home⁶ will follow in this chapter. A number of sergeants usually employed as clerks, drill-masters, and instructors in the schools, always kept the companies to which they belonged more or less impoverished; so to end a system that could not be avoided, but which operated injuriously, Lord Panmure gave authority, on the 9th October, for the removal of fourteen specially employed sergeants from the companies, bearing them on the rolls of the corps as supernumeraries. Two of the number were appointed staff-sergeants.

Widening daily into unwieldy dimensions, with a meagre controlling staff, gave rise to other essential appointments in the corps. On the 17th December, an Adjutant (Captain F. E. Cox, R.E.) and a Quartermaster (Michael Bradford, from the rank of sergeant-major) were commissioned.⁶ The appointment

⁶ The ancestry of the Bradfords can be traced, traditionally, to a very remote period. It commenced, as far as the family information extends, with Ranulph de Broade Forde—since contracted into Bradford—who in 1191 served under Richard I. in the Holy War, and fought at the siege of Ascalon in the third crusade. Apparently, the patronymic of the Broade Fordes was derived from a fortress held by Ranulph as the heir of his race, which defended a ford

of Brigade-Major, long felt to be an inadequate staff rank, was changed to that of Assistant Adjutant-General. Heretofore the chief executive of the royal sappers and miners held no higher

at the confluence of two streams important in border warfare on the marches of Wales.

Without attempting to renew the links in the broken chain of genealogical succession, it seems that in the direct line from Rannulph sprang John Bradford, who was born at Manchester about 1522. At an early age, under Sir John Harington, Knight of Exton in Rutland, "treasurer of the King's camps and buildings," and chief engineer at Boulogne, he served as paymaster at the siege of Montreuil in 1544. Three years later he was a student of common law at the Inner Temple, where he became a convert to Protestantism; and relinquishing, in 1548, his secular intentions, became a student at Cambridge, and soon after a Fellow of Pembroke College. Ridley, Bishop of London, ordained him deacon in 1550, and next year he was installed as a prebendary of St. Paul's, and appointed one of the six chaplains of Edward VI. to preach in the distant parts of the kingdom. In 1553, a month after the king's death, and the accession of Queen Mary, Bradford was a State prisoner. The truthfulness of his preaching, his great popularity as a minister, and Christian firmness in promoting the reformed doctrines, did not suit the religious régime which, under the bigoted intolerance of the Queen, had commenced to disturb the fabric of the reformation. On a trumped-up charge of sedition and heresy he suffered two years incarceration in the Tower and King's Bench, and, at length, refusing to retract his pious convictions, was martyred, by burning, at Smithfield, 1st July, 1555.

From a brother of this "champion of the faith" lineally descended the Rev. Edward Bradford, rector of Buckland Filleigh.

John, a son of the rector, married Gertrude Coham, of Coham. Considerable landed property was held by the family from the Earl of Orford and his successors, the Lords Clinton; but the estates having been placed in chancery, leases without the possibility of renewing them, and an extensive fire having consumed a great part of the market-town of Sheepwash, laid the foundation of a series of calamities from which the family have never recovered.

Among the offspring of John, were John, William, and Michael. The two first were surgeons in the royal navy, William perished in the foundering of the "Royal George" at Spithead, June, 1782. Michael was likely to have retrieved the fortunes of the family by his success as a surgeon, but he died young, leaving, among other children—

Michael, an orphan of four years of age. There was enough for the son when he arrived at man's estate to pass comfortably through life, and he married well. His wife was Mary Tamlyn, daughter of Bamfylde Tamlyn, by Mary, second daughter of Richard Somers, Esq., of Northawton, Devon, and sister of the wife of Robert Harrington, Esq., of Worden. The father of Bamfylde Tamlyn, was the Rev. Gregory Tamlyn, rector of Bradford. In the Will of John Bamfylde of Arlington, the relationship of Rector Tamlyn with the family is acknowledged in a passage which affectionately styles him "my beloved cousin." The pedigree of the Bamfylde is of undoubted antiquity, and

regimental rank than that of Captain, with the staff commission of Brigade-Major. Under the same authority a sergeant-major and a quartermaster-sergeant were added to the corps.

There was an Exhibition at Fort George, Mauritius, in December, 1855, of a collection of productions indigenous to the island, and subjects of a constructive nature, to represent the industrial habits of the community in that distant region. Indebted for the idea to its great prototype in London, the Exhibition originated with the 22nd company of the corps stationed there, and most of the articles—such as models of inventions and objects of mechanical interest in the island—were contributed by non-commissioned officers and privates of the company, of whom sergeant Frederick Hibling was the chief exhibitor. The exposition was open for a week. Each day had its appointed charge varying from 3*d.* to 2*s.*, and the surplus receipts were applied to charitable purposes.

From Bermuda the 21st company arrived on the 22nd December, leaving a small detachment of invalids to carry on the works. Its removal was accompanied by a representation which told of the loss the colony would sustain by the step; but the urgency of affairs in the East admitted of no consideration interfering with the resolve of sending the company to the Crimea, constituted as it was of climatized men and competent artificers. At the time of their landing, however, there were strong indications of diplomatic negotiations putting an end to existing differences; but to prepare the company for the worst, it was forwarded to Aldershot on the 8th January, 1856, under the command of Lieutenant J. H.

this branch of it is a shoot from the stem to which cling the Baronets and Lords of Poltimore. Young Michael, who had increased by his marriage, his pecuniary competence and standing in society, was not remarkable for the economy of his pursuits. He was fond of sporting in all its phases, and indulged in other expensive habits, which ended in his ruin.

From this marriage sprang five sons and a daughter. Michael the quartermaster is the second son. He is thus a collateral descendant of Bradford the martyr, and a "poor relation" of a few families of repute and distinction at the present day.

Wilson, to be trained in camp to the discipline and usages of war.

Another of the changes which resulted from the incorporation of the ordnance service with the army was the removal of the head-quarters from Woolwich to Chatham. Successive Directors of the establishment at Chatham had shown the benefits probably to accrue to the corps by the measure, but forty years' representation were insufficient to dispose of the counter-disadvantages which were considered to be the effect of instruction carried out at two stations—one for forming the soldier, the other for working up the soldier into a sapper. At a time when the country was expecting changes, and those changes promised a return to the State more beneficial than an adherence to old systems was likely to yield, nothing was permitted to stand in the way of making the trial. Accordingly the fiat was issued by Lord Panmure; and Chatham from the 10th January became the head-quarters of the corps. On that day, Lieutenant-Colonel Yorke, Assistant Adjutant-General, marched into Brompton Barracks at the head of the sappers, leaving for the works at Woolwich a strong company quartered in temporary huts erected in Mill Hill road.

A detachment had been sent to Van Diemen's Land in 1852 at the request of the Colonial Legislature to carry on the surveys of the settlement, but it had barely entered on its duties when a feeling of hostility was shown to its employment. Whenever a chance offered of presenting it in an unfavourable aspect, the Legislative Council greedily accepted it, and gave the imperial party the full weight of its opposition. In August, 1855, the Governor-General sent a message to the Council recommending Captain Hawkins who commanded the surveyors, for the appointment of Surveyor-General, but between a select committee nominated to inquire into its necessity and the Legislative Council, the office was never conferred. Matters went on coldly enough; the Council had grown stubborn in its sentiments; and to show that the colony had a will of its own, notwithstanding a royal warrant had been issued to form the detachment in accordance with the warm wishes of those who had authority to represent the wants of the province, the

colonial secretary coolly intimated to Captain Hawkins, on the 16th October following, that himself and detachment were at the disposal of the Governor of New South Wales! The men composing the party were volunteers, had made sacrifices to emigrate, had purchased land in the vicinity of their labours, and were collecting about them members of their families, who, by ones and twos, had struggled to leave their English homes and were on their way to distant Tasmania. In revoking the service, the conduct of the rulers was as heartless and supercilious as absolute; and in beguiling men, by fair promises, to volunteer to serve them; then discountenancing their efficient exertions, and finally, without consulting their wishes, arranging for their transfer to any colony which might be in need of such a detachment, was a feature in colonial management strongly savouring of exceptional faith. The end of all was, that a few of the party, sooner than break up their new homes, took their discharges, and the remainder leaving Hobart Town on the 9th February, arrived in five days after at Sydney, to renew in that colony, under the auspices of Sir William Denison, those services so little appreciated by the censors of Van Diemen's Land. Captain Hawkins, still in command of the detachment, fixed his head-quarters at Paramatta.

Under the authority of Lord Hardinge, the Commander-in-Chief, dated 2nd April, several increases and alterations took place in the corps. The 23rd company being composed of drivers was thrown out of the numeral roll of the companies and designated the A troop of the royal engineer field equipment. Its constitution and pay was fixed as under:—

	s.	d.
1 troop sergeant-major . . .	3	9 a-day.
1 troop quartermaster-sergeant .	3	9 "
4 sergeants each	2	10 "
6 corporals "	2	4 "
6 second-corporals "	2	2 "
1 farrier	3	4 "
4 shoeing smiths each	2	0 "
2 collar-makers "	2	0 "
2 wheelers	2	0 "
100 drivers	1	9 "
2 buglers	1	9 "

To fill up the gap occasioned by its withdrawal, another company, numbered the 23rd, was formed in April. The Corfu company which held a distinct organization, had its establishment risen from 82 to 120, so that it might take its place among the general service companies. A Band was also formed, consisting of one sergeant, one corporal, one second corporal, and thirty private musicians. The detachments raised by special royal warrants for service in Van Diemen's Land and Sydney were absorbed in the 20th company. The result of all was that the corps gained a clear augmentation of 169 non-commissioned officers and men, and its organization was established according to the following detail:—

	Colour Sergeants	Sergts.	Corps.	2nd Corps.	Buglers	Privates	Total	General Total.	
22 general service companies, each	1	5	6	6	2	100	120 =	2640	
1 survey company	1	5	6	6	2	100	120 =	120	
3 survey companies, each	1	7	8	8	2	99	125 =	375	
								3135	
The band		1	1	1	..	33	..	33	
	Serjnt - Major.	Q.-mast - Sergt.	Sergts.	Corps.	2nd Corps.	Artificers	Engl	Drivers	Total.
Driver Troop	1	1	4	6	6	9	2	100	129 = 129
Staff—Supernumerary sergeants with the rank of colour-sergeant									12
4 sergeant-majors; 4 quartermaster-sergeants; 1 bugle-major, and 2 staff-sergeants									11
1 assistant adjutant-general; 2 adjutants to corps, 1 adjutant of field equipment, and 4 quartermasters									8
General total									3328

This establishment was far greater than had been allowed even during the oppressive years of the Peninsular war, and the number of companies, long in its teens, had swept on by successive augmentations to 27—one being a driver troop.

Without any increase of pay from state sources, the band is supported by an annual subscription from the officers of engineers managed by a committee, of which the assistant adjutant-general is president. Though never recognised, a brass band had been in existence for many years, but when the new order of things was sanctioned, a reed band was established as more in keeping with the refinements of a distinguished corps. The

accomplished features of an operatic orchestra were also introduced combined with the sacred musical accessories of the church; and the bald services of a garrison chapel which, until the arrival of the head-quarters at Chatham, was conducted without singing, has recently been varied and made additionally grateful by the use of chants, glorias, psalms, &c.⁷

The costume of the band, approved by Prince Albert, is perhaps the handsomest in the service though the contrasts are extreme. A black bear-skin head-dress, scarlet cloth trousers, and white cloth tunic constitute the uniform. The first is free of embellishment and without feather or plume, but has a gilt curb chain for the chin. The trousers have a stripe of gold lace five-eighths of an inch broad down the outer seams, a distinction never before, it is believed, conferred on any band in the service. After the Hungarian fashion, but less picturesque, the tunic is tastefully trimmed with gold lace, gold tracteries, and gold square untwisted cords for the shoulders. All the lacing is half an inch wide and the tracing is worked with Russian braid. Cut on the model of the corps' tunic, except that the skirts have no slashes and the fronts are curved, its facings and edgings, of silk plush, are of a bright blue, and agreeably harmonize with the white cloth, giving it an appearance of ultra delicacy. Let but a storm soak it, and its elegance departs. The collar is laced all round and traced on the inner edges, enlivened by eyes in the angles, and a crow'sfoot at the centre. The cuffs are similarly laced, and traced on both edges with a series of eyes and finished with crow'sfeet. Down the front

⁷ Mr. William G. Collins was appointed master 1st August, 1856. He joined the royal artillery band at ten years of age. When he had established his name as a performer, he turned his attention to composition, and was instructed as a theoretical musician by James Harris, Esq. Mus. Bac. of Oxon. When quite a young man he was promoted to be master of the band on the recommendation of Sir Henry Bishop and the President of the Royal Academy of Music—Cipriani Potter. Subsequently he held a similar situation in the Royal Bucks Militia Band, which, from his peculiar fitness and attainments, became one of the best bands among the regular troops or militia in the kingdom. On the disembodiment of the regiment, his engagement with Lord Carington having ceased, his well-known reputation led to his instant appointment as master of the Royal Engineer Band.

edges and back seams to the bottoms of the skirts both in front and rear, the lace again occurs traced in and out and figured at the terminations with a play of artistic fancy developed into highly florid crowsfeet. Simpler configurations crown the lacing of the back seams, which is relieved at the waist by ornithological devices resembling, with greater truth, a sprig of shamrock than the object to which the tailors have so strangely likened them. Down each breast are five bars compressed in length as they reach the waist, traced on both edges, having eyes at the corners and terminating at the points, with the ever-present crowsfeet. Except the two shoulder buttons, the tunic possesses no adornment of this kind, the fronts being closed by hooks and eyes.

The waist-belt is of white patent leather; the plate the same as that worn by the staff sergeants, the sword has for its hilt an ornamental Maltese cross bearing the device of a buglehorn, and sheathed in a black leather scabbard with brasses ornamentally shaped. It is shorter than the one worn by the buglers. The forage cap is similar to the sergeants'; but the jacket and trousers are like the drill dress of the privates with an addition to the jacket of twisted gold shoulder cords, blue cloth edgings, and blue cloth piping down the hind arms and back seams terminating with blue cloth cushions as substitutes for buttons.

A very pleasing uniform has been adopted for the bandmaster, of scarlet cloth without breast bars. In all other essential particulars it is laced, traced, and figured like the tunics of the musicians. The facings and edgings are of garter blue silk velvet. The collar is traced with a series of eyes on the inner edges of the lace; and the shoulder-cords trebly twisted are ornamented with embroidered grenades. The trousers, for bandmaster and bugle-major, are of dark Oxford mixture with a stripe of rich gold lace, one inch and three quarters wide, down each outer seam. In undress is worn a dark-blue cloth surtout, single-breasted, hooked up to the neck, with upright rounded collar, and five loops two inches wide of mohair braid down the front, which are further ornamented by the addition of a row of

netted barrels, and flys. All the rest of the trimming is similar to that on the surtout of the quartermasters. The forage cap and trousers are also similar, but the accoutrements of the bandmaster with one exception correspond with those of the staff sergeants.

Instead of a sword he wears an elegant scimitar, short and light, in a brass scabbard, the hilt being composed of masks and foliage of the "cinque-cento" period. The curve of the gripe issues in a lion's head, with ring attached, bearing a flowing treble twisted fretwork chain united to a ring at the guard.

Considered advisable to add to the system of instruction at Chatham the art of photography, four non-commissioned officers were sent to Kensington Palace on the 6th March to learn the process; and after being taught at Gore House by Mr. Thurston Thompson, returned to Chatham on the 5th May; since which date photography has formed an interesting item in the instructional proceedings of the establishment.

Akin with this is the system introduced by Captain Du Cane on his return from the Crimea for teaching non-commissioned officers and men the method of using the electric telegraph for military purposes. So successfully had the schooling of the men in this department of field usefulness been conducted, that in June a small force of sapper telegraphists was sent to Aldershot to establish the field telegraph. Three stations were soon in action, one at each of the camps, and one at Farnborough close to the electric telegraph company's office. Double needle instruments were used at each of the stations and double wires connected with them stretched over the roofs of the huts and borne over the open spaces by poles rising between twenty and thirty feet high. A non-commissioned officer or more acted at each station and two always at Farnborough. Line orderlies attended the sappers to carry the messages.

Purfleet, attached from time immemorial to the Woolwich district, was, under the new order of things, combined with the created district of Waltham, and the small party of six sappers, which for many years had been employed in the Ordnance repairs at the station, was removed to Woolwich in May.

To add to the military efficiency of the corps, one sergeant and eight rank and file, commanded by Lieutenant G. R. Lempriere, were sent to Hythe in May to learn under Colonel Hay the approved method of rifle practice and judging distances. Their success was looked upon as very satisfactory. Though less time at drill than other detachments they stood well in the comparison, and one of their number, lance-corporal John Yelland, bore away the prize pen and certificate awarded by Colonel Hay. He was the best shot out of 164 men of different regiments who had for some months been contending for the honour. The sappers returned to Chatham on the 5th August, and the information obtained at Hythe has become one of the leading features of instruction at the royal engineer establishment. Lieutenant Lempriere is the instructor; and some of the men who have passed through his hands have proved themselves better shots and better in judging distances than the Hythe prizeman.

1854.

BOMARSUND—TURKEY—BULGARIA—WALLACHIA.

War with Russia—Detachment attached to Baltic fleet—Second company to the Aland Islands—Landing—Brigadier-General Jones—Preliminary services—Operations—Fort Nottich attacked—Adventure at Fort Tzee and escape from it—Bomarsund captured—Destruction of the forts—Conduct of the company—Sickness; it returns to England—Detachment to Turkey—Augmentation to the corps—Seventh company withdrawn from Hurst Castle—Eleventh and seventh companies to Turkey—Odessa—Services of the first detachment in Turkey—Corporal Cray—Gallipoli; Boulair; Ibridgi—Commendation by Sir George Brown—Tenth and eighth companies to Scutari—Redoubt Kaleh—Works there—Circassia—Working-pay—Companies attached to divisions of the army—Buyuk Tchekmedjue—First detachment to Varna—Followed by the tenth company—Also by the eleventh—Complimentary order for services of the latter—Contrast between the French and English sappers—Works at Varna—Also at Devno—Encampments at Aladyn and Varna—Works at Gallipoli and Boulair—Eighth company to Varna—Gallantry of corporal Swann and private Anderson—Sappers join at Varna from the fleet—Coast of Circassia—Photographers—Detachment to Rustchuk—Trestle bridge at Slobedzie—Bridge of boats over the Danube—Return to Varna of a portion of the sappers from Rustchuk—Misconduct of the detachment; also of the seventh company—Spirited conduct of corporal Cray—Major Bent and party of sappers to Bucharest—Private Anderson and the Austrian Dragoons—Fourth company to Varna—The Somerset Fund—The Central Association.

To obtain a religious protectorate in Turkey, Russia menaced the independence of the Sultan, which led to a long diplomatic negotiation between the Western powers and the Czar; but as the Emperor Nicholas persisted in interfering with the rule of the Sultan, and attempted to enforce his pretensions by occupying with a belligerent army the Danubian principalities, Great Britain and France declared war against Russia. Measures were instantly taken to give effect to the declaration by despatching powerful expeditions to the East and the Baltic.

To the Baltic fleet were attached, on the 9th March, one sergeant and nineteen rank and file of the second company, under the command of Lieutenant Nugent of the engineers, which embarked at Portsmouth on board the 'Duke of Wellington,' flag-ship of Vice-Admiral Sir Charles Napier, and accompanied it in its reconnaissance of the Baltic Sea and the Gulf of Finland as far up as Cronstadt. The object of sending the party with the fleet was, that it might take the lead of the scamen and marines in any escalading operations ashore; but the nature of the service was such that no occasion offered for resorting to the expedient. During the time that the cholera was rife in the fleet, several of the detachment were seized with the malady, and three died.

When it was resolved to make a descent upon the Aland Islands, a division of the French army was despatched from Calais to carry out the enterprise. The second company, of eighty strong, under Captain F. W. King, royal engineers, was added to the force, and sailing from Deptford in the 'Julia' transport on the 15th July, with every conceivable engineering requirement, arrived at Calais on the 17th, and took on board 225 officers, non-commissioned officers, and rank and file of the 51st infantry of the line. The sappers were the only troops that accompanied the French contingent.

Before daylight on the 8th August, the second company, 600 of the royal marines, and 2000 French troops landed at a small cove a few miles N.E. of Bomarsund, and taking a winding route by the village of Monkstetta, encamped about 1,200 yards from Fort Tzee, sheltered by a hill on which the breaching battery was afterwards constructed. The advance of the van was formed by the sappers from the flag-ship, carrying besides their carbines an assortment of bill-hooks, hand-saws, axes, and hatchets, and the column was closed in rear by the second company under Captain King.

The British operations were wholly carried out under the direction of Brigadier-General Jones, R.E., an officer of matured judgment and experience, gained by hard service in the Peninsular War, and by some forty years of after study

and experiment. He was assisted by Captain H. St. George Ord, and four other officers of the corps.

Nearly five days were employed in collecting the tools and stores, cutting roads, effecting preliminary reconnaissances, preparing an hospital, and in providing domiciles for the temporary accommodation of the company, by making huts of the branches of fir trees; while a strong party, about 400 yards from the hill, worked with unflagging industry in making fascines and filling sand-bags, which, when finished, were carried by the seamen and marines to the *dépôt* near the site of the intended battery.

Meanwhile two or three attempts had been made by some officers of the corps, attended by a few intrepid sappers, to trace the battery; but the enemy opened so heavy a fire upon the parties, that a suspension of their exertions necessarily followed. Determination and tact, however, got over the difficulty. No trace was used, but a simple alignment struck, from which, on the 13th August, under shade of the evening, sergeant John Jones and twenty-four rank and file, began to construct the battery, under the orders of Captain Ord. Without the chance of digging a shovel-full of earth to give solidity and strength to the cover, the battery was built on the bare rock entirely of fascines and sand-bags. The sappers reared it unassisted, except that the royal marines carried the material from the engineer's park to the hill. Sergeant John Jones had the honour of laying the first sand-bag. In ten hours, the detachment, unrelieved, nearly completed the battery, which would soon have opened upon Fort Tzee; but the French having forestalled the arrangement by obtaining the surrender of its commandant, the battery was free for other employment, and its direction was consequently changed against Fort Notich. Speedily the epaulement which flanked the battery was prolonged, the platforms promptly laid, and three 32-pounders having been placed in position, the embrasures were unmasked by some daring sappers, and the firing, which lasted about nine hours, ended at the fall of the day in the capture of the garrison. It was surrendered to Captain Ord, R.E., who had with him to

receive the formal capitulation, a force of 100 of the royal marines and five rank and file of the sappers.

The added work was partly constructed in the day, under fire, as was also the laying of the platforms. Corporal Peter Leitch,¹ a first-class carpenter with some handy men of the company, attended to this service. The working party was relieved every four hours day and night, until the battery was completed, and also during the siege, to throw fatigue and danger equally upon all. The guns fired by the seamen and marine artillery were first drawn by them to the battery on sledges of a novel construction, over steep and rugged ascents. When they reached the camp, however, their labours were considerably diminished, as a road to assist them had been cut by the sappers, up the hill to the breaching battery, under the orders of Captain King. Corporal George Luke acted as overseer in this duty. Two of the men were allotted to each of the guns to keep the embrasures in good order. This they usually attended to while the gun was loading, and not a few displayed a stoical coolness and intrepidity in repairing the damaged merlons, and clearing away the debris occasioned by the enemy's cannonade. Though the fire upon the battery was warm at times, the casualties only embraced two killed, of whom one was the Hon. Lieutenant Cameron Wrottesley, R.E., and one wounded. None of the sappers were even touched; and this good fortune, as well for them as the seamen and marines, was attributed to the prudence of Brigadier-General Jones, who had men appointed to look out and warn the battery when the enemy's guns were fired. These "look-out" men were sappers—alert spirits with quick eyes and stout hearts—who gave the alarm the instant a flash was seen at the fort. The better to enable them to give the intimation they took ground in advance of the battery in some chasms of the rock, where, although partially screened by the natural cover of their hiding places, it was a wonder that they escaped unhurt. Pri-

¹ Promoted to be sergeant. Was the principal non-commissioned officer in charge of the huts sent from this country to the Crimea; and was wounded severely in the assault on the Redan on the 8th September, 1855.

vates James Moncur² and Thomas Ross³ were most conspicuous in this hazardous duty.

When the French had captured Fort Tzee the Brigadier-General gave an order for sergeant John Jones to make a plan of it. He had a note to the officer commanding the garrison requesting the service to be permitted. Taking with him privates John S. Rowley and George Peters to assist, he started on the morning of the 15th, but contrary to expectation found the French had abandoned the work and taken shelter in an advanced trench. Presenting the request to the French Commandant, the sergeant awaited authority to proceed. The fort was on fire, having been shelled by the Russians the previous evening. The Commandant and several French officers advised Jones not to venture into the place, but with soldier-like firmness he persevered in urging the performance of the duty; and permission being granted, he and his assistants went on. Going through one of the embrasures, which was on fire, and the gun-carriage burning, they pushed into the tower. Loose powder, broken cartridges, and live shells were lying about; the flames had nearly spread to the principal magazine, the remainder of the building had more or less fire in every casemate, and the smoke in thick columns was streaming from the crackling apertures. With difficulty they gained the first floor, and then, finding the stairs, penetrated to the roof, not without being almost suffocated, and losing, for a time, private Rowley in the smoke. From floor to floor and embrasure to embrasure they moved, in hopes of stealing the barest chance of taking even a few measurements, but their efforts were unavailing; and so, compelled to quit the tower, they had scarcely reached

² A man of unsteady propensities from a long residence at the Cape of Good Hope, where liquor is cheap. He is, however, a first-rate soldier and sapper, and his intrepid bearing in the trenches before Sebastopol, gained him a special medal "for distinguished service in the field," and a gratuity of five pounds. Such notice accorded to him as one of sixteen out of a fighting force of about 900 men, may well excite his pride; and if there be a tide in the affairs of men, surely this proud incident will cause that turn, and so fashion his future career that it will be as remarkable in peace for temperance and good behaviour, as in battle for heroism.

³ Died in camp before Sebastopol, in January, 1855.

their own camp, about 1,200 yards away, when the flames having communicated with the magazine, it exploded, and the fort blew up.

Without attempting to chronicle the different incidents of the campaign, in which the fleet and the French troops so gallantly participated, it will be sufficient to note that Bomarsund, the principal fort of the Aland Islands, capitulated without material opposition, and the Russians were marched out prisoners of war. The sappers and miners and royal marines formed in line, faced by a force of the French infantry; and through their divided ranks, the Russians moved pensively away to the point arranged for their departure.

No sooner were the forts in possession of the allies than measures were taken to disable the guns and dismantle the works. The sappers only were employed in carrying out the mining operations under the direction of their officers. In this duty they worked with so much energy, that their exertions were scarcely checked by the fatigues to which they were necessarily subjected. Forts Prasto, Nottich, and Bomarsund all fell in turn—blown up by mines skilfully laid and fired. The magazines also were exploded, the shot and shell removed, and stores of timber, prepared for use in the contemplated fortifications, were burnt. The work of destruction extended even to the garrison chapel; it was sacked and then destroyed, and all the unfinished forts and buildings, rising from foundations which marked the extent of a stupendous engineering design, were torn up by mines and thrown down. The stone landing-pier was likewise demolished, and not a slab of granite which promised to be of service in future works was left unbroken. But a few weeks, and what a change! This proud maritime position—this formidable outport of the yet impregnable Cronstadt, studded with forts and bristling with ordnance, was one widespread area of ruin and desolation!

Brigadier-General Jones and the officers of the corps were well pleased with the military bearing and exertions of the company, and commended the “cheerful and willing manner in which they performed the laborious duties” assigned to them. Besides the non-commissioned officers and men named above,

there were others noted for their services. Privates John Williams,⁴ John Veitch,⁵ and Francis Enright, for their boldness, resolution, and zeal. Corporal George Luke,⁶ for his ability and usefulness as a miner in the demolition of Bomarsund. Sergeant John Jones,⁷ for his assistance as a draughtsman; and sergeant Richard P. Jones,⁸ for his general diligence and intelligence, as well in the general operations as in the special one of diving. The 'Penelope' having run ashore on an unknown rock off Bomarsund, was compelled to throw fifteen of her guns overboard, to float and save her. Several naval divers attached to the fleet were afterwards employed to bring them up; but as some submarine difficulties prevented as speedy an accomplishment of the undertaking as was desired, the co-operation of sergeant Richard Jones was found to be an acquisition, inasmuch as he recovered five 8-inch guns and one 10-inch.

There was much sickness among the sappers during the brief campaign, and on one day no less than forty-seven men out of a company not a hundred strong, were on the sick-list with choleraic symptoms; but owing to the attention of the naval surgeons, only two died. Quitting the Baltic Sea in the 'Cumberland,' the company rejoined the corps at Woolwich on the 16th October, and before two months had intervened, was despatched in all haste to Turkey.

It is now time to turn to the East, to trace the movements and services of the corps in that interesting quarter. The van of the army sent thither under the command of Lord Raglan, was a small party of six rank and file of the sappers and miners under Captain Chapman of the engineers. They belonged to the fourth company, at Malta, whence they sailed in the

⁴ Sent to the Crimea as a submarine diver, and died in camp before Sebastopol, April, 1855.

⁵ Died in December, 1854, before Sebastopol of cholera.

⁶ Killed in the trenches at the siege of Sebastopol, July 17, 1855.

⁷ Now second sergeant-major of the corps at the Royal Engineer Establishment, Brompton.

⁸ Has been frequently noticed in these pages for his labours in the demolition of the 'Royal George' and 'Edgar' at Spithead.

'Banshee' on the 25th January, and having arrived four days after in Beicos Bay, were the first British soldiers landed on the Ottoman shores.

To meet the calls for its services in the coming struggle, the corps, by order of Lord Raglan under date the 23rd February, was augmented from an establishment of 2,218 of all ranks to 2,658 officers and men, by enlarging the organization of each of the twenty-two companies with one sergeant, one corporal, one second-corporal, and seventeen privates. The corps was now fixed according to the following details:—

	Colour Sergeant	Ser- geants	Cor- porals	2nd Corp.	Bugl.	Privates.	Total	General Total.
17 general service companies, each	1	5	6	6	2	100	120 =	2040
1 company for Corfu	1	3	4	4	2	68	82 =	82
3 survey companies, each . . .	1	7	8	8	2	99	125 =	375
1 survey company	1	5	6	6	2	100	120 =	120
Sydney mint detachment . . .	1	1	3	.	.	11	16 =	16
Van Diemen's Land detachment .	1	2	.	.	.	12	15 =	15
								2648
Staff—1 brigade-major, 1 adjutant, 3 quartermasters, 2 sergeant- majors, 2 quartermaster-sergeants, and 1 bugle-major . .								10
							Total	2658

To concentrate the available force for active duty, the seventh company, employed in services of a secondary character only, was withdrawn from Hurst Castle, and removed to Woolwich. While at the castle the company had assisted in strengthening the place by constructing two batteries for ten and twelve guns respectively, and also three loopholed caponiers, built of brick and cement in the moat of the castle. Quartered as it was upon an exposed shore, in a spot that was isolated and dreary, the conduct of the company was anything but satisfactory, and in the short space of eighteen months, out of a strength that scarcely exceeded ninety non-commissioned officers and men, no fewer than twenty-three privates deserted.

On the 24th February the eleventh company, under Captain Hassard, embarked at Southampton for Turkey on board the 'Himalaya' steamer, in which was shipped a store of intrenching tools for field operations. At Malta they landed on the 8th March, and were temporarily quartered at Florian. The

seventh company—Captain Gibb's—joined them on the 27th March, and brought with them a further supply of tools and implements. Two days later both companies embarked in the 'Golden Fleece,' and steamed off with the rifle brigade to Gallipoli, where they landed with Lieutenant-General Sir George Brown on the 8th April. About forty non-commissioned officers and men of the corps were left at Gallipoli, and the remainder, marching nearly nine miles, took up a position not far from the village of Boulair, from which the camp derived its name.

On the 17th April twelve rank and file of the eleventh company, detached to Constantinople, joined the 'Fury' steamer for service in the Black Sea, and were present at the bombardment of Odessa. The squadron was hotly engaged when the 'Fury' arrived, and after firing a few rounds, was signalled from the action by the Admiral. On the 23rd April she was again in the fight for two hours, but her presence in the action is not noticed in the official despatches.

Meanwhile the six men with Captain Chapman, R.E., who in the course of a few months had been in six different vessels, were, during the intervals, employed under their officers, surveying Fort St. Nicholas, on the Asiatic side of the Dardanelles, and the country from thence as far as the gulf of Saros. A few weeks later they assisted in a similar service at Boulair and Gallipoli, and then sailing again up the Bosphorus to Beicos Bay, landed at Therapia, from whence seven days after they removed to Constantinople, pushing out a party of four men under Lieutenant De Vere to survey Buyuk Tchekmedjie, a district some twenty miles from the port.

When Sir John Burgoyne was in the country prior to the arrival of the troops, private James Cray was his orderly, and accompanied him to Varna and Shumla. Majors Dickson and Wellesley, with Lieutenants Burke and the Honourable George Wrottesley and lady, were of the party. From rough roads and inclement weather the journey was not without its trials; and at night the little expedition rested by the road-side in any nook or hovel where they could find shelter.

Subsequently private Cray was orderly to the heroic Lieutenant Burke, R.E. With him he passed a few days at Silistria, and then took horse to a small town on the banks of the Danube nine miles from Rustchuk. Major Wellesley had given him a sword, but this was not considered sufficient for his defence, and he was provided from the Turkish armoury with a Minié rifle and revolver. Thus armed, he joined the Ottoman forces in an action against the Russians, who under cover of a fusillade from a strong body of riflemen, were endeavouring to cross the river. Met by a fire it was impossible to stand against, they faced about and retreated in their boats to land. Cray was thus the first soldier of the British army engaged in the common cause, and for his conduct on the occasion was presented by Lieutenant Burke to Omar Pacha. His next ride was to Sistova. At the time the party entered the town an engagement was going on, and the Turks were again victorious. Journeying onwards they crossed to an island, where Lieutenant Burke and his orderly at imminent risk laid out new works, and traced batteries to complete the defences of the place. On that occasion private Cray exchanged between twenty and thirty shots with the enemy, who kept up a sharp fire upon the party from the opposite bank. In all his tours of inspection and survey, from the Danube, across the Balkan chain to Adrianople, and back again by another route to Constantinople, private Cray accompanied Lieutenant Burke, and for his usefulness and spirited conduct was made lance-corporal and afterwards attached as orderly to the Brigade-Major.

The detachment at Gallipoli erected piers at the port for landing stores, guns, &c., and prepared hospitals for the sick. The companies at Boulair assisted to form the lines on the left of the position allotted to the British troops to execute. About 1,500 men of the infantry were daily distributed for some months to the trenches and roads, and performed their tasks with ardour and cheerfulness. One man detached to Ibridgi, about fifty miles distant on the north side of the gulf of Saros, superintended the Greeks in felling and collecting brushwood and timber, for the construction of magazines, platforms, log-

huts, &c. A fluctuating party, numbering at one time nine men under a corporal, was afterwards detached on this duty.

When Sir George Brown, who commanded the division, took his departure for the frontier, he communicated in orders of the 6th May "his entire approbation of the general conduct, zeal, and industry of the royal sappers and miners on the works, both at Gallipoli and the camp at Boulair."

Two other companies were quickly reorganised to reinforce the corps in the East. These were the tenth under Captain Bent, to form the pontoon train, and the eighth from Gibraltar, under Captain Bouchier. The former embarked at Woolwich in the 'City of London' steamer, on board of which was Lieutenant-General Sir De Lacy Evans and staff, and the staff of the Duke of Cambridge. Sir De Lacy Evans was well pleased with the conduct and services of the company on board, for they had much to attend to in strengthening the horse-boxes. Landing at Constantinople on the 24th April, the company was quartered in Scutari barracks, as was also the eighth on debarking from the 'Albatross,' on the 9th May. The pontoons sent out in the 'Melbourne' in charge of corporal William Dickson, an able and intelligent non-commissioned officer, reached Constantinople on the 13th May.

The sappers attached to Her Majesty's ship 'Fury' being transhipped to the 'Agamemnon,' bearing the flag of Rear-Admiral Lyons, served with the squadron in a cruise on the coasts of Circassia, Georgia, and Anatolia, and were present on the 19th May in the reduction of Redout Kaleh.

Next morning the party landed, and were employed for two days as overseers in the defensive occupation of the place, under the orders of Lieutenant H. Cox and H. B. Roberts, of the royal marine artillery. Parties from all the ships were ashore at the works. The Turks, utterly unacquainted with the mode of protecting themselves by intrenchments, were instructed by the sappers. A Russian barrack was speedily loopholed, a stone building in a commanding situation was converted by massive planks into a block-house as an outwork, and a parapet was formed, flanked by a deep marsh. Houses, too, that could

not aid in the defence were thrown down, whilst others, well sited, were turned into points of security and resistance. The old fort on the land side was also strengthened with additional works. When these services were sufficiently advanced, the Turks with two sappers were left to complete the defences, and the Anglo-French working parties, with the remainder of the sappers, returned to their ships.

Renewing its cruise, the squadron anchored off Bardan. Landing Captain Brock, R.N., Captain Stanton, R.E., a doctor, and four sappers, they started, guided by an escort of Circassians commanded by Ismail Bey, over the mountains, to communicate with the prophet-warrior Schamyl.

Late in May, Lord Raglan ordered the sappers, when employed as artificers "in repairing tools, constructing wharves, and the like," to receive working pay; the non-commissioned officers at the rate of 1*s.* a-day, and the privates 6*d.* to 1*s.* a-day each, according to conduct and ability. The non-commissioned officers appointed conductors of stores, photographers, electricians, &c., were granted 2*s.* a-day each.

To form a connexion between the sappers and miners and the army, the four companies with the expedition were attached to the divisions as follows:—

1st division	.	.	11th company	.	.	Captain Hassard.
2nd	„	.	8th	„	.	Captain Bourchier.
3rd	„	.	7th	„	.	Captain Gibb.
Light	„	.	10th	„	.	Captain Bent.

Four men employed for a few weeks with Captain Chapman, R.E., in the survey of Buyuk Tchekmedjie, were recalled to Constantinople late in May, as the intention of forming that district into an encampment had been abandoned, owing to the altered character of events.

While the carpenters of the companies at Scutari were fitting up horse-boxes for the cavalry on board the transports, a forward movement was commenced by a detachment of one sergeant—John F. Read—and twenty-seven rank and file of the tenth company, commanded by Lieutenants E. C. A. Gordon and Pratt, which landed at Varna from the 'Car-doc' on the

22nd of May. Precedence was given to this party for the purpose of erecting jetties to land the troops, horses, and ordnance, on the arrival of the army.

On the 26th of May, the remainder of the company under Captain Bent, disembarked at Varna with the pontoons, from the 'Cyclops' steamer. The removal of the company was an expeditious operation, for in less than ten hours from the time of receiving orders, the pontoons, stores, horses, and all the miscellaneous gear attending a war company of sappers, were stowed into one vessel, and then transhipped into another when subsequent orders rendered such an arrangement imperative. In allusion to the company's departure, the corps was spoken of in the 'Times,' as a "most indefatigable and invaluable body of men."⁹

Simultaneously with this movement, Captain Hassard's company sailed from Gallipoli, when their exertions elicited the following complimentary order from the officer of Royal Engineers in command.

"On board the 'Emu,' 25th May, 1854.

"Captain Gordon thanks the eleventh company, for the zealous and willing manner with which they worked during the whole of last night, and till six o'clock this morning, embarking intrenching tools and stores, immediately after their march in from the camp at Boulahar. This exertion, so cheerfully performed, as to enable the company to proceed without loss of time on active service, will be brought to the notice of the Brigadier-General." It was so and received his hearty acknowledgments.

The company disembarked at Varna on the 27th, and the scene at the quay was strikingly interesting and animated. About 250 French sappers had also landed from the 'Cacique,' and working as they did some twenty yards from the British sappers, a good opportunity was afforded for contrasting the temperament and military habits of the two nations. The French, gay, volatile, and impulsive, stirred about with elated spirits and elastic activity, that gave a cheerful, though an im-

⁹ June 1^o 1854.

petuous aspect to their exertions; whilst the English sappers, grave, impassible, and taciturn, wheeled off scaling ladders and stores so devoid of bustle and joyousness, and with so much attention to order and composure, that an air of stern and serious necessity was impressed on their labours. Nevertheless, the work was done with a business-like energy and earnestness that seemed more than adequate for any task or enterprise.¹⁰

Varna for a few months was the principal frontier station and depôt for engineer stores and pontoons, from whence parties were thrown out to Devno, Aladyn, Monister, Rustchuk, &c. At Varna the companies built a stone pier of some pretensions, and a wooden one at the south side of the bay, run out into deep water 140 feet from the beach. They also banked up the shore, deepened the little harbour, and improved the almost trackless roads beyond and within the vicinity of Aladyn, making them passable for heavy wheeled conveyances. Much of the work was carried on in bog and water, which, however, was ultimately discontinued, as it was found that some of the men who were so employed, died from cholera, traceable to their exertions and exposure.

About seventy men of the tenth company marched to Devno on the 29th May, who repaired the roads, removed the accumulations of years from deserted fountains, rendering them again useful for thirsty wayfarers, built ovens for baking bread, raised dams to collect water for the troops, and constructed a bridge across the lake. From a lonely burial-ground, filled with blocks of unhewn and unsculptured granite, marking nevertheless the sites of numerous graves, the sappers took the largest stones, and used them in erecting a bridge over one of the narrow channels which joined the lakes of Aladyn and Devno. The men worked very hard, at times up to their breasts in water. The correspondent of the 'Times,' in speaking of this work—June 29th—termed the sappers "a most utilitarian corps;" while Captain Gordon, in a letter to a brother officer, remarked with respect to its general services, "that

¹⁰ 'United Service Gazette,' June 17, 1854

the men work well and behave well. To be with them is a pleasure."

A party of twelve men with sergeant Thomas Dumvill, under Lieutenant Creyke of the engineers, was employed for three days at Carra-Houssan; and having placed the several wells in order, and rendered the neglected fountains available for use, it returned to Devno. It was expected that the light division would march through the village of Shumla, but the intention was afterwards abandoned. The sappers therefore were the only British troops at this advanced frontier station.

At Aladyn, the sappers were encamped in a valley covered with the thickest foliage, and its many rural accessories of creepers, clematis, wild vines, &c., made the scene as picturesque as grateful.¹¹ At Varna, the companies were tented as nearly as possible to their work, while a detachment was quartered for a time, close by the city walls, to be ready for any emergency:¹² but when the cholera had to some extent decimated the camp, the sappers were removed, to improve their sanitary condition, to a healthier location on the south side of the bay.

The seventh company at Gallipoli and Boulair, in addition to their duties on the lines, constructed a number of log-huts, stores, and stables for the cantonment of a regiment, in the event of the army being compelled to fall back to the isthmus, as to another Torres Vedras, for succour and safety.

The eighth company from Scutari landed at Varna on the 19th of June from the 'Golden Fleece' steamer, and joined the frontier companies.

Lance-corporal William Swann and private Andrew Anderson accompanied Captain Bent and Lieutenant Burke to the beleaguered fortress of Silistria, starting on the 17th of June. Arriving too late to share in its defence, they shortly afterwards repaired to Rustchuk, where a hazardous attack upon the Russians holding the opposite bank of the Danube, was undertaken on the 7th of July by Hassan Ilaki Pacha, the commander

¹¹ The 'Times,' June 29, 1854.

¹² Ibid.

of the Turkish force at that fortress. The attack was made on three points, Captain Bent leading one of the divisions. Lieutenant Burke also led a detached party of Turkish troops across the river in boats. The two sappers were attached to him, and it is of their conduct particularly, and not the general incidents of the battle, that the following record will give an account. Gaining the island, the party of Turks jumped on shore, and forming in line, gallantly pushed on, and were met by superior numbers. A fierce hand to hand struggle ensued, and Lieutenant Burke, with desperate valour, slew with his own strong arm six of his opponents, falling early on the strand covered with frightful wounds. The sappers stood by their officer, and fought "well and bravely." In the midst of the conflict, private Anderson, a stalwart soldier, tried to save the heroic young man whose spirit inspired all with courage; but though the attempt unhappily failed, he dealt out slaughter among the Russians with incredible effect. It was not long before the little band of Turks, overpowered by numbers, retreated to the boats. Mindful of the sacred duty that devolved upon him, Anderson, with daring devotion, three times threw himself into the ranks of the enemy, and at last rescued the bleeding body of his officer. Though encumbered with his carbine and other arms, he endeavoured to bear it away on his back, but such was its weight—for the lieutenant was a powerful man, and of robust stature—and such the heaviness of the fire upon him, he was obliged to relinquish his purpose, leaving the body concealed in some long grass. Taking the dead man's sword to save it from falling as a trophy into the hands of the enemy, he made good his retreat to the river. Scrambling down its sedgy bank, which varied from three to six feet in height, the party renewed the conflict, and improved their cover by a hasty entrenchment, in the formation of which the Turks used their hands and bayonets, and the sappers their swords. Corporal Swann was here soon disabled; and, wounded in the head by a blow from the butt end of a musket, he was falling, when, a second blow across the shoulder-blade, threw him into the water. There for four hours he lay insensible, and was providentially

saved from drowning by a thick woollen shirt he wore.¹³ Anderson, now the only British soldier with the little batch, acted as became his manly character, and encouraging the Turks by his prowess and endurance, the brave detachment maintained the unequal contest with veteran firmness, and only recrossed the Danube when the necessity for their services had ceased. In that hard-contested battle, private Anderson killed no less than fourteen Russians, himself escaping miraculously without wound or hurt. Next morning, though it was uncertain whether the enemy was in ambush or not, he pushed over to the island again, and recovered the body of his officer, but what a sad spectacle did it present! It was headless; thirty wounds from bullet, sabre, and bayonet, riddled his remains, and his fingers had been chopped off to secure the rings he wore! The battle of Giurgevo ended in a victory for the Turks. Ten hours the fight lasted, and the loss on both sides was considerable. For their gallantry Swann was promoted to be second corporal,¹⁴ and private Anderson decorated, by Omar Pacha, with the order of the Medjidie. His highness himself placed the star on the brave man's breast, and then, in friendship, warmly shook his hand. In the 'London Gazette' of January 12, 1855, appeared the following gratifying announcement. "The Queen has been pleased to grant unto private Andrew Anderson of the Sappers and Miners, her royal license and permission that he may accept and wear the order of the Medjidie, which the Sultan has been pleased to confer upon him, in approbation of his distinguished bravery and good conduct at the passage of the Danube on the 7th of July last, and subsequently in rescuing the body of his commanding officer, Lieutenant Burke, after he had fallen; and that he may enjoy all the rights and privileges thereunto annexed."—"And also to command that Her Majesty's said concession and

¹³ 'Illustrated London News,' August 5, 1854.

¹⁴ Soon after was advanced to the rank of corporal for his conduct at the siege of Sebastopol, and died of wounds received in the trenches, in May, 1855. One of his legs was amputated, from which, though he bore up for a few days, his exhausted strength did not permit him to rally.

especial mark of her royal favour be registered, together with the relative documents, in Her Majesty's College of Arms."

The four sappers landed from the 'Agamemnon' in May, were for six weeks in Circassia with Captain Brock, R.N. In returning to the ship, they, with six other men of the detachment on board of her, accompanied the fleet in its subsequent cruises along the coast, and in the Black Sea. No longer required for service afloat, the party landed at Baltschik, and marching to Varna, rejoined their companies on the 16th and 18th July.

Early in July, Lieutenant Lempriere left Varna for Circassia in the French steamer 'Vauban' with orders to place in a state of defence, some of the towns along the coast, which, having been wrested from the Russians were now being menaced by them. Sergeant Marshall and private Richards accompanied him. On the 11th the party landed at Churuksu, the Turkish head-quarters on that frontier, and soon completed a survey of the place and its vicinity. Obligated to remain there a few days, three or four officers of the 'Vauban' and Lieutenant Lempriere visited some of the Turkish outposts and detached forts. With the party were some French sailors and private Richards. When about to return, two of the sailors and the sapper were missing. Nothing could be heard of them, and it was concluded they had strayed into the hands of the Russians. Skirmishers were sent out to scour the country. Wood, wild, and mountain were threaded in quest of the wanderers, and all hope of tracking them had wellnigh been given up, when a quick eye observed them in the bush—apparently unconscious of the concern they had created or of the chances there were of the enemy capturing them—coolly stuffing themselves with blackberries! Stocked with a good supply of the fruit, they were guided back to the party, who, no longer uneasy about the safety of their attendants, shared with the wayfarers the contents of their wallets and enjoyed an agreeable dessert.

At Redoubt Kaleh a small body of Russian cavalry closely approached the Turkish works to reconnoitre the position, but a

few rounds from the batteries quickly dispersed them. Information had reached the enemy of the arrival of some English troops, which, in all probability, was more than corroborated, by the glimpse they must have caught of one of the four red-coated sappers constituting, at that time, the entire British contingent on the coast of Circassia. Whether this was or was not enough to excite the fears of the Russians, certain it is, that a considerable body of them in anticipation of an attack, threw up some earthworks on the banks of the river about five miles away.

Cruising along the coast, now in the 'Vauban,' now in the 'Wasp,' Lieutenant Lempriere and his men landed for short intervals at Pitsunda, Soukum Kaleh, Redoubt Kaleh, Anacrea, Churuksu, Batoum, and lastly, all went up to Trebizonde. The two Kalehs were the fortresses at which the services of the sappers were chiefly given. At Redoubt Kaleh two men who had been left by Captain Stanton as overseers to the Turks joined Lieutenant Lempriere's little force. In addition to instructing the Ottoman soldiers in the mode of forming field-works, the sappers superintended the restoration of some old batteries and revetments, the construction of various new defences, and assisted Lieutenant Lempriere in the surveys he found it necessary to make for professional purposes. While they were thus busy, the Crimean Expedition had been determined on, and as every sapper was wanted for the enterprise, the party was recalled and rejoined the corps just as the siege was about to open.

Corporal John Pendered and lance-corporal John Hammond arrived at Varna on the 24th July, and were attached as photographers, under Captain Hackett, 77th regiment, to the head-quarters of the army. Previously to leaving London they had been instructed in the art by Mr. Thompson, and had practically tested their efficiency at Chatham, where patches of broken ground, and military scenes and fortifications, gave them a variety of subjects to portray. Many of their photographic sketches, taken under circumstances of difficulty and disadvantage, were exhibited at Gore House during the summer months; but without having the chance of proving their useful-

ness and skill, these two young men, promising and enterprising, perished in a storm.

At the request of Omar Pacha a detachment of the corps, under Captain Gage, R.A. and Lieutenant Pratt, R.E., started from Aladyn for Rustchuk on the 8th July, to form a bridge over the Danube for the passage of the Ottoman troops. It consisted of sergeant John F. Read, one bugler, and thirty-two rank and file, accompanied by fifteen French pontoneers, and thirty-five English seamen from the fleet, under Lieutenant Glynn and Prince Leiningen, R.N., twenty of whom led the way, and fifteen covered the rear. With characteristic pride, the seamen gave importance to the honour accorded them by carrying unfurled, both in front and rear, a large union jack. All were on horseback. Next to the advance sailors were the sappers, unskilled in equestration, in every conceivable attitude, mounted on young horses. Each led a second horse loaded with intrenching tools, &c. Behind them followed about 150 horses ridden by native grooms and guides, bearing tools, baggage, and forage; and then came the party of French pontoneers. The expedition went from twenty to thirty miles in twelve hours, killing three horses in the first two days. Many of the animals, unaccustomed to the rattling of picks and shovels against their flanks, were difficult to manage, and in their fright and restiveness, frequently dashed away from the cavalcade. Considerable delay occurred in recovering and restraining them, and what with unavoidable halts at Schumla and Rasgradt, the party did not reach Rustchuk until the 13th July, though the distance travelled was only 120 miles. This novel equestrian journey was accomplished without any material mishap, except a few almost harmless falls, and the occasional diversion of a horse and his rider rolling together on the road. Hard riding, however, on ill-formed and broken tracks, made the men so sore and stiff, that when the time for rest arrived, they found it preferable to sleep standing!

On the 15th, the sappers were sent over to Giurgevo, and for a few days assisted to intrench the position of the Turks; when, on the 19th, at the desire of Omar Pacha, they moved

up to Slobedsie, and under the superintendence of Captain Bent and Lieutenant Pratt constructed, in a very creditable manner, a trestle bridge over the Slobedsie Creek, which was 450 feet across, to a small island in the Danube. Notwithstanding that several of the men, as many as fifteen in one day, had been ill during the operation, the work was finished on the 25th.

Next day the sappers joined the French pontoneers and English sailors, in throwing a bridge of boats across the main stream, at a place some 890 yards wide. A few boats had been laid when the sappers commenced. The pontoneers worked from one shore, the sappers from the other; whilst the sailors rowed up the boats and assisted to secure them in position. The boats, fixed with a clear bay of twenty feet between, gave for each of the series about forty feet of bridge. The breadth for the roadway was eighteen feet six inches. Wood was scarce at the spot, and the timbers for the superstructure in great part were obtained from Sistova and Widdin. Intended for heavy service the bridge was made of massive baulks and stout oak planking, strongly bolted, cramped, and racked. Much "difficulty was experienced in securing some of the boats in the more rapid part of the stream, but by mooring them with four anchors each, and the aid of heavy ordnance sunk above the boats and securely fastened to them," they stood against wind and surge, firm and unbroken.¹⁵ "It was completed on the 4th August, and on the 5th received some damage from the first Austrian steamer that passed during the war. This was soon repaired,"¹⁶ and to obviate a similar casualty, an opening was contrived to permit the navigation to continue, which, when not required, was closed up again by a moveable raft to make good the bridge. In appearance it was as artistic and elegant as useful. The longest boats occupied the centre, from which the smaller craft gradually fell away to the two shores. Like ancient galleys they were shaped with stems and prows curving gracefully upwards from the water.¹⁷ The bridge was no unworthy rival of the celebrated one formed

¹⁵ The 'Times,' Sept. 15, 1854.

¹⁶ Ibid.

¹⁷ Ibid.

by Xerxes, in his passage of the Hellespont at Abydos. "On the 10th, Omar Pacha opened it in person, and complimented the officers and men for the zeal and ability they had shown in its construction. Captain Bent was in command of the sappers."¹⁸ For the ceremony two triumphal arches of evergreens were run up, one at each end of the bridge, and above them proudly waved the allied banners of England, France, and Turkey. To crown the service, both French and English met in unmixed cordiality and friendship, at a costly repast provided by Omar Pacha.

No longer required for service with the force of his highness, eighteen of the detachment returned, on horseback, to Varna, under Lieutenant Pratt, R.F., passing through Turtukai and Silistria, where joining the English seamen, they quitted it again on the 15th August. At night, after a march of twenty miles, the party halted at Kinarjik. On the next day a further march of thirty miles found them encamped at Karapelt; another thirty took them to Karayal, where a sapper who had died on the route was buried. A beautiful spot was selected for the encampment, and at sunset the deceased was interred in a hastily-excavated grave, beneath the sombre shade of a wild pear-tree.¹⁹ All the officers and men were present, and from the absence of all display, and the fatigued, rusty, and travel-stained aspect of the men, the ceremony was impressive and mournful. On the 18th August, travelling fifteen miles that morning, the sappers reached head-quarters, and rejoined the tenth company. Corporal Swann, who had been appointed by Lord Raglan provost-sergeant to the mule-drivers at Rustchuk with a salary of 4*s.* 6*d.* a-day, returned to Varna with the party.

Not without mortification it is necessary to introduce in this place a record relative to the misconduct of the Rustchuk detachment. Honoured as they were by being the only British soldiers selected for an advanced frontier duty, much was expected from their conduct and exertions; but their extreme

¹⁸ The 'Times,' Sept. 15, 1854.

¹⁹ I 'd

irregularity and drunkenness, with few exceptions,²⁰ offered a striking contrast to the behaviour of the party of sailors and the Turkish garrison. To mark therefore the displeasure of Brigadier-General Tylden, he subjected the detachment to a course of severe discipline, and stopped the promotion of some of the non-commissioned officers. Several men of the seventh company also, who had commenced a career of intemperance at Hurst Castle, behaved with equal discredit, and disgusted their officers. It is a pity in a corps possessing the advantages of education, skill, and mechanical attainments, that there should exist anything to tarnish the fame the well-intentioned are striving to brighten.

As a set-off against this censure, it is well there is occasion to give place to an instance of individual good conduct, as honourable as meritorious. Varna was set on fire by some Greek incendiaries, instigated by Russian agents, and was only extinguished after much of the city had been laid waste, and considerable munitions destroyed. Brigadier-General Tylden directed the operations for saving the town. The companies of sappers, being on the south side of the bay, were not present, but lance-corporal James Cray, whose services under Lieutenant Burke have been already noticed, acting as the Brigadier's orderly, lent material aid by his intrepidity in arresting the flames. "When the danger was greatest," says the official report, "and the spreading flames threatened to reach the large Turkish powder-magazine, corporal Cray laboured voluntarily and incessantly, by mounting scaling-ladders and closing the openings with blankets, thus not only largely contributing to the safety of the magazine, but setting an example to the sailors and others assisting, which was of the greatest service." He was promoted to be second-corporal for his conduct.

Captain Bent, with fifteen non-commissioned officers and men left at Rustchuk under Omar Pacha, accompanied the Ottoman troops into the Wallachian principality, entering the capital on the 22nd August. Corporal Harding, a zealous and able

²⁰ Sergeant John F. Read, corporal William Harding, William Swann, and privates Robert M. Rylatt, Michael Westcott, and John Piper.

sapper and pontoneer, died that day from cholera on the line of march, and was buried in the graveyard of a small country Greek church. His remains, covered with a union jack, were attended to their final resting-place by all the Englishmen in Bucharest, and the service was read by Mr. Meyer, a missionary clergyman. A private was attacked by the grave of his comrade, and returning to his tent, soon afterwards died. He was buried in the Lutheran churchyard. Several other choleraic seizures occurred in the detachment, which were ascribed to the intemperance of the men, and their imprudent use of fruits. No British soldiers, save this small party, served during the campaign in the Wallachian capital.

The occupation of Bucharest by the Austrians was followed by many ungracious acts which it was never anticipated a chivalric nation would impose on a defenceless people. These were chiefly felt in the forcible possession of the houses of the citizens without the courtesy of seeing whether they could be accommodated. No excuse could be offered for such ungallant proceedings, as the police had provided the Austrian troops with suitable billets. The same inconsiderate demeanour was paraded before the few British sappers quartered in the capital, who, to prevent the possibility of a pretext for collision, were all pent up with their Captain—Bent—in one domicile.⁴¹ In their activity to find comfortable stabling, some Austrians, commanded by a sergeant, ordered the horses belonging to Captain Bent to be taken out to make room for three lively steeds which the pirating party had brought with them. It was not to be borne that they should attempt to encroach upon premises already too limited for the reasonable wants of the Captain and his sappers; and private Andrew Anderson, who happened to be on the spot at the time, met their demands with courageous sternness. This unexpected resistance caused the sergeant valorously to motion with his sabre, and to threaten, among other desperate penalties, to hang the Englishman; but Anderson, indisposed to yield his trust—though the odds were against him—made so imposing a demonstration of physical determina-

⁴¹ The 'Times,' Oct. 26, 1854, by the Author of 'The Russian Empire.'

tion, that the dragoons, taken somewhat aback at his boldness, quickly decamped, and abandoned the intention of quartering themselves or their horses in the British billets.

The fourth company from Malta, under Captain Craigie, reinforced the corps at Varna on the 14th August, and a detachment of the third company at Corfu was also sent thither, arriving at the head-quarters on the 25th August. They were ordered from their respective stations to the seat of war by Lord Raglan.²²

²² A few weeks before the Central Association commenced its humane operations, a fund was raised by Captain and Adjutant Somerset to aid the wives and children of men of the corps ordered to the East. The Central Association took its rise from a letter which appeared in the 'Times' on the 22nd February, 1854, on which date, singularly enough, Captain Somerset received the first subscriptions for his fund. As the working of this regimental charity could not but be limited, Captain Somerset did his best to lessen the chances of its being too soon exhausted. He therefore personally advised every married man before embarking, as to the course he ought to pursue during his absence from England, and obtained from him an agreement to make a monthly remittance, suitable to his means, for the support of his wife and family. This was not a difficult interference, for the men were only too anxious to make the utmost provision it was in their power to arrange. Of this regimental fund Captain Somerset had the entire charge. By his exertions it reached the sum of 210*l*. ; of which 72*l*. were subscribed by the four survey companies. The rest was added by officers of the corps at home, a few companies of sappers, and the personal friends of the Adjutant. Its plan was to make advances—obtaining repayment of them by remittances from the seat of war; also to award donations, and to provide, in unforeseen circumstances, domestic troubles, sickness and death, such relief as the several cases needed, and which could only be met in this way. "The Somerset Fund," so quiet and unpretending in its exercise, was of great benefit to the corps; and of about sixty women and nearly one hundred children who, by loans and grants, drew support from its means, not one ever had occasion to seek the cold shelter of a workhouse. With one or two exceptions, the wives of the sappers behaved with virtuous propriety during the absence of their husbands, and were a credit both to them and the corps.

The Central Association was a national undertaking, in which the wives and families of the corps, equally with those of the rest of the army, shared to the full extent of its numbers. It properly does not belong to this history to notice the gigantic operations of the Association, and the extraordinary good it achieved; but it may nevertheless be permitted to say, that the royal sappers and miners will ever retain a warm recollection of its beneficence, and cherish the name of Major the Hon. Henry Littleton Powys—the untiring advocate of protection to the soldier's wife and family, and the gratuitous Honorary Secretary of the Association—with feelings of lasting gratitude.

1854.

CRIMEA.

September 18th October.

Instructional operations—Embarkation for the Crimea—The landing—The sappers sink wells—Attempt to erect a pier for landing the horses—Bed of the Bulganak improved with reeds for the passage of artillery—The Alma—Services of the sappers during the battle—They repair the Buliak timber bridge—March to Balaklava; Sir John Burgoyne; services of the third company—The corps encamps at Balaklava—Then removes to the heights before Sebastopol; misery for want of tents—Parties assist to reconnoitre the positions and trace the lines—An instance given—Two sappers carrying the mail miss their way, are wounded and benighted—Destruction of Upton's aqueduct—Positions on the heights, staff engineers—The attacks; parks—Sapper brigades—Reliefs—Breaking ground—Duties of the sappers—Their deficiency of tact in working the skilled portions of the batteries—Progress of the works; a party wanders from the track—Sergeant Morant misses his way, and only discovers his mistake when encountered by a Russian guard—A mistrusted guide restores confidence by his conduct—State of the works on the night before the first bombardment—The batteries and parallels—Siege operations—Restoration of the works—Sir John Burgoyne's remarks on them.

PRELIMINARY to active operations in the Crimea, the companies of the corps at Varna superintended contingents of the line in preparing a park of gabions, fascines, sand-bags, and platforms for siege purposes. Each sapper at the duty had charge of fifteen men of the line, divided into three squads of five in a squad. The troops were also practised in the hasty formation of field-works; and these instructional services were not without profit to the men of the corps, who, as overseers, superintended their execution.

Early in September the allied forces embarked for the

(Crimea, and the naval arrangements for the occasion, though vast and complicated, were comprehensive and perfect. To each of the British divisions was attached a body of sappers and miners, bearing with them intrenching tools. Up to this time there had landed in Turkey six companies of the corps, mustering a force of 513 non-commissioned officers and men, which had been reduced to 492 men by the decease of 21 non-commissioned officers and privates, chiefly from cholera and exposure. Leaving the seventh company at Gallipoli, also detachments at Varna, Redout Kaleh, and Bucharest, and the sick on board the transports and at Scutari, the force of sappers and miners that landed near Lake Tuzla in Kalamita Bay on the 14th and 16th September counted a total of 308 of all ranks.

Under a teeming rain, two of the companies debarked, and without tents or covering, took up a miserable bivouac with their divisions. In the night they lay huddled together for warmth, while the storm beat ceaselessly upon them, and turned their selected resting-places into pools and quagmires. The returning day found them drenched, stiff, and comfortless; but in none, except those poor enfeebled fellows still suffering from the pest that had proved so fatal to the troops at Varna, was there wanting a cheerfulness to work, a spirit to master hardship, and a determination to endure. Unsheltered as they were, that fearful weather brought on many aggravated cases of cholera.

Water, the first want felt after landing at Lake Tuzla, caused several wells to be sunk by the sappers on the strip of land which stretched between the lake and the Black Sea. The supply thus obtained was too brackish for human use, and the duty of furnishing the troops, therefore, depended on the fleet.

At noon on the 15th, a detachment of the fourth company commenced to erect a temporary pier for landing the horses, with timbers furnished by the fleet. For a considerable distance to seaward, the water was shallow, but it swelled to the beach, and broke there with great violence. Trestles fixed and braced were held for a time in their places by sturdy men,

but the driving breakers rushed to the shore with so resistless a force it was impracticable to proceed; and men and timbers borne away in the surge, only escaped by grasping at ropes which were laid conveniently to the site in anticipation of such accidents.

When the army was put in motion, and the Bulganak stream was reached, its bed was found to be too muddy for the passage of the artillery with the 4th division. Early in the morning of the 20th a portion of the fourth company was told off to make a track through the water for the guns. Collecting the reeds which grew there in abundance, the sappers tied them faggot fashion into long bundles, and placing them in the bed of the stream from bank to bank, the artillery, in twenty-two minutes from the time of commencing, was crossing the river with clean wheels in comparative ease.

On the 20th was fought the battle of the Alma, which was gained in three hours by the allies, with a loss to the British exceeding 2,000 killed and wounded; whilst the carnage amongst the Russians was even greater. The sappers and miners during the action were thus distributed:—

	No
Head-quarters, 3rd company . . .	36
Light division, 10th „ . . .	62
1st „ 11th „ . . .	62
2nd „ 8th „ . . .	77
3rd „ 4th „ . . .	34
4th „ 4th „ . . .	35

The fourth division was not engaged, being in reserve; but the sappers with the other divisions, though not called upon to participate to an extent that placed them in much danger, were under fire. The companies were held back, ready with their intrenching tools, to perform any service for which they might suddenly be required; but the daring advance and overpowering prowess of the British rendered a resort to field-works as a means of defence wholly unnecessary. The tenth company crossed the river by the ford and bridge while the battle raged. The eighth company, attached for the moment to one of the field-batteries, assisted in dragging through the river some field-

carriages belonging to the royal artillery, one of which, having become disabled, capsized in the stream.

The eleventh company, under the direction of Captain Montagu of the engineers, rapidly repaired the broken timber bridge of Buliack, part of the sheeting of which had been removed by the Russians, leaving the end on the side of the British untouched. Had this artful contrivance not been discovered, the troops would doubtless have suffered fearfully in their attempt to pass over the bridge. Its restoration was of great service, as it enabled the whole of the baggage to be up with the army the same evening. For six hours there was an uninterrupted stream of well-laden carts and other vehicles crossing it, which tested to the utmost the efficiency of its renewal, and corroborated in part the encomium of Captain Montagu that it was "done right well and very quickly." The fourth company was stationed about a quarter of a mile away from the Alma, and the third was with the baggage in rear.

On the night of the 20th the companies bivouacked on the site of the battle, where one of the privates, worn out by disease and fatigue, covered himself with his blanket and died. Resuming the march, the allies passed the Katscha on the 23rd September, on which day the third company, attached to the head-quarters of the army, was reinforced by the arrival from Woolwich of 66 non-commissioned officers and men under Captain W. M. Inglis of the royal engineers. Two days later the march was continued across the Belzec, and on the 26th to Balaklava by a bold flank movement through a difficult and thickly-wooded country. Sir John Burgoyne passed a night in bivouac with the company, and all that could be got for him to rest upon was an old door. Upon that the aged warrior stretched himself with a composure and satisfaction that showed how well he had braced himself to the vicissitudes and hardships of war. On the way the baggage of a Russian division, spreading over a vast extent of road, fell a prize to the British army. The third company was hurried to the front with artillery to remove it, and tumbling the waggons over the hill they broke in fragments in the valley. When the army pushed

forward, the third company remained, blew up a magazine of thirteen barrels of gunpowder which was found with the train of baggage, and then hastened to Balaklava. All the companies arrived there on the 27th September, and were at once disposed of in making roads, sinking wells, and repairing shattered waggons, while the third company made good a rough pier at Balaklava, at which were landed the heavy ordnance, ammunition, and siege stores.

The royal engineers formed their encampment on the S.S.E. of the harbour of Balaklava, whither the siege material was conveyed. With great promptitude, guns and ammunition, gabions, fascines, sand-bags, and tools of all descriptions, unsurpassed in magnitude, were collected, and then despatched to the depôt about four miles nearer to the scene of operations.

By the 30th September a strong force of sappers moved to the ground, and soon commenced those services which the public, too enthusiastic in its anticipations, expected would reduce a fortress of unexampled strength in a few days. Full twenty days the company were without tents, their camp equipage having been left in the ships which conveyed the sappers from the shores of Bulgaria; and, exposed as they were in bivouac to the damp and chills of night, many robust and able men fell a prey to cholera at Balaklava, or predisposed, by these early trials and rigours, to disease, were struck down by suffering and exhaustion in the camp before Sebastopol.

Next night some sappers, pushed forward under their officers, assisted to examine the ground in front of the fortress towards Chersonese Bay; and although at times within rifle-range of the walls, were unmolested by the Russians. It was at first intended that the English troops should occupy this position, but in consequence of the tools of our allies being too light to carry out the heavy intrenchments assigned to them on the right, the disposition of the forces was altered to adapt them to the situations for which their material seemed to render them adequate. This change in the arrangements was followed by the preliminary duty of tracing the sites of the required trenches

and batteries inland, in which some sappers were permitted to participate.

Among those who first left the camp to reconnoitre were lance-corporal McKimm and private Jenkins, in whose resolution and discipline reliance could be placed. They were apt men and sufficiently acute in comprehending orders not to worry their officers with strings of fatiguing questions about small details; and such was their stamp and bearing, they were not likely, in danger, to leave their officer unshielded. To Captain Montagu's party of six sappers they were attached. In the darkness of the morning of the 1st October, the whole moved on in advance of the outlying pickets for nearly a mile and a-half, and quietly and in whispers, wandered over a country guarded by pickets in ambuscades as yet unknown. On their way they passed some posts which were alive with Cossacks, one of which they unwittingly approached so closely, that a couple of shots were fired at them. This was simply tendered as a warning to depart, for the Cossacks made no attempt to follow the explorers, and so continuing to give the points of ground and intersections to the Captain to enable him to form his sketch of the position of the left attack, the delineation was, in three or four hours, finished. With a careful pace yielding no perceptible sound, and a sharp look out, the party in returning crossed hill and ravine and passed pickets and sentries, reaching the camp safely at six o'clock in the morning.

It being necessary to despatch the mail from the first division at Balaklava to that of General Cathcart's on the heights S.W. of Sebastopol, corporal John McQueen and private James Brennan volunteered for the duty. Cheerfully they jogged along the lonely road, and having delivered the letters at the camp commenced to return with that easy *abandon* so becoming soldiers. McQueen had been out on a coasting expedition, and prided himself with the belief that because he knew Sebastopol from the sea, he must as a consequence know every step of the road to Balaklava. He, however, soon found out his mistake. Losing their way, the letter-carriers struck on a road which took them into the Picket House ravine, up which they

strode at a steady pace, straining their eyes through the darkness to discover a clue which should enlighten them as to their situation. Presently they were hounded by some dogs led on by a horseman with a glimmering lamp attached to his girdle. Luckily a cavern was near, and the sappers bounding into it, the dogs and the Cossack passed on. Allowing sufficient time to elapse to confuse the rider and his canine attendants, the comrades emerged from the cave, and regaining the road, turned in the direction of Sebastopol, impressed with the conviction that they had taken the correct route for the port. Allured by a fire which was burning on the hill to the left of the ravine, they began to ascend the slope to join the picket—supposed to be a Turkish one—who, grouped around the blazing sticks, were enjoying their pipes—an enviable pastime in which McQueen was anxious to participate. The night was still black; nothing could be seen, especially in the valley, for the picket-fire spread its capricious illumination over so small an area, that beyond the guard, the faint outline of objects only could be traced, and a little further on the dimness thickened into impenetrable darkness. So, suddenly coming on a pair of sentries concealed under some overhanging rocks, the sappers as suddenly stopped without losing their coolness. “Give me light, Turco?” said McQueen, placing a pipe between his teeth and pressing its bowl near the sentry’s chibouk. The sentry shrunk back: he was a Russian, and without word or challenge, in a moment the bayonet flashed, and the next it was plunged through the corporal’s body, while the companion sentry stabbed Brennan in the left shoulder. At the instant McQueen shot up in the air, then fell; but deadly wounded as he was, his entrails bursting through the puncture, he started from the ground, and, accompanied by Brennan, both ran at a furious speed pursued by the swift-footed sentinels. A wide ditch interrupted their course, into which McQueen and Brennan tumbled, but the cowardly Russians—for such they were to attack two unarmed men—gave up the pursuit.

McQueen moved not from the spot where he fell, for the shock he had received had doubled him up, and though his

agonies were deep, he retained his consciousness. Brennan, suffering himself, set to work to alleviate, if possible, those mortal pains which at times made the corporal writhe and groan. His hand came on a well of blood, which told him, if the flow were not immediately stopped, the closing scene would soon be over. His plan of action in this extremity was quickly fixed, and taking off his shirt he tore it in strips, and tying them into one length bound it round his comrade. This, however, was not enough, for the blood still oozed through the bandage, and tearing away as much as he could of the corporal's shirt without increasing his pangs, he knotted this also, as he added shred to shred, and plied it over the wound. This was the most he could do, except to encourage his spirit to bear the trial with the manliness his comrades would expect to hear he had exercised. "My head feels cold," said he faintly. Both had lost their caps in the violent run they made to the ditch. Brennan instantly took off his coat and turbaned it round the poor fellow's head. "Here is a little bag with fourteen shillings in it," said the corporal, as he released it from his neck. "Give it to my wife. It will never be my happiness to see her or the children." This he said with an affectionate but choked utterance. "Tell her," he added in a stronger voice, "I'm sorry I shall not see Sebastopol fall."

"Why not? there's plenty of skill in the camp to cure you," returned Brennan in a tone of mingled sympathy and confidence.

But McQueen had become absorbed in his thoughts, and his agonies giving him but little disposition and energy to hear with attention anything that Brennan might say, the latter proposed to reconnoitre in the hope of discovering some means of bringing in succour or of escaping. The corporal assented, and Brennan stole away bare to the waist with a streaming wound bitten by the cold of a raw night. The battery above them was an earthen one well armed, but no gunners were in it. From its ditch he proceeded by a sort of ramp towards the Garden batteries, and came upon a strong structure built, as it seemed, out of a ship's side. It was near the Flag-staff battery, and

mounted many guns, forty-five of which he counted—some of very large calibre. Clear it was that he was in the heart of the Russian outworks. In that direction there was no escape, and as every step towards the creek bore the aspect of seeking danger when there was still a chance of evading it, he returned to the ditch, and threw himself by the side of the corporal. Time wore on sluggishly; moments were minutes, minutes hours. At length the morning broke; still he waited till it had sufficiently opened, to guide himself, to the best of his reason, aright; when, gathering up the wounded man, he bore him in his arms to a broken wall in front of a wine-press where had lived a Scotchman for more than twenty years before the war had driven him from his chosen homestead. Here Brennan, overpowered, laid down his comrade, for he was a massive man and deadly heavy. Concealing him in a secure place, and binding up his head with a handkerchief, Brennan dressed himself again in his worn coat, and darted off for assistance, keeping well under the rocks which, overgrown with broom and wild vegetation, helped to cover him from observation. At last he made the bend of the ravine, and climbing up the steep, gained the top, where, crawling onwards among the heather and scrub he saw at the back of the hill the red points of six English tents—distant about fifty yards. It was a grateful sight, but he had not time fully to enjoy it; and so dashing up to the encampment, breathlessly demanded help for his suffering comrade. A few words to explain the nature of the painful adventure which had occasioned his unexpected appearance was more than enough for the officer of the 60th rifles in command. With two men of his regiment bearing a stretcher they hastened along the ravine guided by Brennan, now running, now walking to recover breath. It was a bright morning; hazard was in every step, but the errand was one of humanity, and they pushed on. At length they made the broken wall, from whence they carried the corporal for more than two miles to the tents of the rifle guard. In a few minutes medical aid was doing its best for the sufferer, but though his wounds were laved and dressed, the air had caught his torn bowels and gan-

grene was irretrievably at work. He was now borne to the camp at Balaklava, where, gradually sinking, he was the first of the siege army to die by the hand of the enemy before Sebastopol.

Meanwhile a party of twelve armed sappers, with sergeant James H. Drew, directed by Lieutenant Ravenhill of the royal engineers, repaired to the Inkermann ravine, and cut off the main aqueduct which supplied the docks in the Karabelnaia with water. This was known as Upton's aqueduct. It was situated in a hollow of the plain which stretched onwards, and at its extremity were some well-appointed horse-men or Cossacks watching for chances to display their prowess. When they retired, the sappers, concealed by some bushes which clothed the slopes of the valley, crept from the underwood and stole on to the reservoir, advancing two sentries to look out from among some trees to give warning of impending peril. The sluice of the aqueduct was arched with stone. All the machinery by which it was manipulated was destroyed: the gate driven into the channel to stop the supply, and coping-stones, key-bricks, and earth jammed into the well and against the now useless gate. Without opposition the demolition was effected, and the little party returned to camp after being out seven hours in this preliminary adventure.

Charged with the right attack, the British held the position which approached the Tchernaya valley, while the French spread in a curve to the left, as far almost as Chersonese Bay. The ground was a sterile waste, wild, rocky, and undulated; bleak in winter, burning in summer. Sir John Burgoyne conducted the British portion of the siege, supported by Colonel Alexander, Major J. W. Gordon, and many officers of the corps. Colonel Alexander, from overwork and anxiety, soon died, and the executive direction of the works devolved on Major Gordon. In time the veteran engineer Sir John Burgoyne, recalled to England to discharge the responsible duties of his home appointment, was succeeded by Major-General Jones, who had received honour and promotion for his distinguished services in the capture and destruction of Bomar-

sund. Major, now Colonel, Gordon commanded the companies in the Crimea as a regiment; Captain, now Major, C. B. Ewart filled the appointment of adjutant, and Lieutenant A. Leahy that of quartermaster, afterwards that of Deputy-Assistant Quartermaster-General.

The British force was divided into two attacks, called "right"¹ and "left,"² their contiguity being broken by a deep ravine through which passed the Woronzoff road. The right abutted on the heights overlooking the middle ravine, and the left leaned away to the position of the allies, but separated from it by the precipitous sides of the Picket House ravine, which debouched on the head of the inner harbour. No longer attached to divisions, the fourth, eighth, and tenth companies of sappers were appointed to the right, and the third and eleventh companies to the left. The united strength of the companies amounted to a force of about 386 non-commissioned officers and men, 32 of whom were sick and 21 at Balaklava. On the high road leading from Sebastopol, and near the windmill, was stationed the engineer dépôt for the right attack; while that for the left occupied an area in rear of the third division, on a plateau adjacent to the artillery dépôt. At both the parks, the carpenters, sawyers, and blacksmiths of the companies carried on the mechanical requirements of the operation unprotected from the weather, or at best in scanty sheds of the most primitive character. In order that the sappers might be easily distinguished in the trenches, they were ordered to wear a band of white tracing tape round the forage-cap.

The strength of the brigades of sappers altogether depended upon the exigencies of the duty, and the numbers available for work. As a general rule, however, each brigade of sappers comprised a non-commissioned officer and eight privates; and each brigade of carpenters a non-commissioned officer and three privates. Whatever may have been the changes in the distribution of the men, there were seldom less at work, on the right,

¹ Familiarly and indiscriminately called "Gordon's battery or parallel," "21-gun battery," or "Frenchman's Hill."

² Called "Chapman's battery or parallel," or "Green-hill."

than three brigades of sappers and two of carpenters by day ; and two of sappers and one of carpenters by night ; while on the left, where a diminished force was employed, the arrangements only permitted for the daily routine two brigades of sappers and one of carpenters ; and, for the night duty, one brigade of each.

Usually, the brigade remained twelve hours in the trenches, being relieved at daybreak and soon after dusk ; but this period of duty, on many occasions, was necessarily prolonged, when any pressure required particular works to be completed in haste. Some of the most reliable men were on duty in the front eight nights out of nine. Fatigue and sickness caused very inconvenient fluctuations in the numbers disposable for the operation ; but when less vigour was demanded in the formation of the lines, the men were relieved from duty in the trenches for three or four days at a time—the interval being filled up with labours in the camp, and in the performance of a variety of services subsidiary to the siege.

At nightfall, on the 8th October, ground was broken before Sebastopol. It commenced at the Greenhill battery left attack ; and on the right attack at the 5-gun battery in front of Victoria hill, and at the picket-house for the right Lancaster-gun. By order of Lord Raglan, the working-parties, after receiving the necessary tools and instructions, were marched from the park, guided by engineer officers and sappers, to the trenches. This proceeding was followed throughout the siege ; and it was also a practice to send both sappers and operatives into the batteries unarmed, to prevent the paramount work of the lines being neglected for the more natural one of resorting, on any slight instance of alarm, to measures of personal defence.

Acting as overseers, it was the province of the sappers and miners to instruct the line and the Turks in forming the trenches and batteries, attending themselves to the more constructive portions of the works requiring art and skill ;—such as laying the gabions, fascines, sand-bags, and platforms ; erecting the splinter-proof magazines, and sloping and lining the embrasures. Formidable obstacles occasionally offered serious

impediments to the progress of the excavations, for the soil was rocky: to overcome the difficulties, the sappers led the way with an earnestness and zeal that stimulated the workmen to activity and exertion; but such was the sacrifice of useful energy, that many a brave fellow, already enfeebled by overwork, scanty rations, and hard weather, faltered from the trenches never more to return.

Singular as it may appear, the sappers at first were somewhat at a loss in carrying out their more ordinary duties. The details were easy enough in peaceful practice; but in a siege where every effort required the utmost care and caution to make the work strong and durable and to avoid danger, it was much more difficult. A little earnest experience however in actual conflict, taught them the secrets of their art, gave them confidence and cunning, and rendered them, as far as their numbers permitted, quite equal to the emergencies of the enterprise.

Everywhere the lines continued to be prosecuted with commendable rapidity, and to claim even the fastidious attention of the sappers with regard to the smoothness and accuracy of the slopes of the interior revetments and the sharpness of the angles. The Madras platforms, to which a high reputation was attached, were quickly laid for the general siege-pieces, and common ones were fixed for the naval guns. There were times, however, when, from the guiding sappers missing their way to the appointed hill, the works were somewhat retarded in their execution. An instance of this kind occurred on the 10th October, when some sappers, sent to throw up a battery in front of the right of the light division, could not discover the position. The night was densely dark, foggy, and close. For more than two hours they endeavoured to find the points marked previously by Major Gordon, but finally seeing the fruitlessness of their efforts, they quitted the front and returned to camp. The working parties were retained in rear under cover; the only men exposed on the hill-top that night were two captains of engineers, and sergeant Coppin and lance-corporals Stuppel and Kerr.

A more serious mistake occurred the next night. Ground had been broken at eight o'clock by a working party of 400 men on the brow of a hill to the left of the light division. Sergeant Joseph Morant, who had received instructions as to the direction he was to take to reach the work, started at midnight with seventeen sappers to relieve the men of the corps whose tour of night-duty had expired. Marching along the Woronzoff ravine, he passed a huge boulder on which was carved a cross, and shortly after reached a large shell which had stuck in the middle of the road. These, for want of better indications, were two of the points on which he relied for the accuracy of his course. Having still to press on for another half-mile and more, and the night being dark, he missed the hollow up which he was to move to the site of the parallel. On he went with his men, when, seeing at length on either height a picquet, he hesitated under an impression he had gone too far; but private George Harvey, apparently priding himself upon his knowledge of the locality, persisted in saying that the picquets were British. Unable to trust to his own sight, for his vision was defective, the sergeant, thus assured, pushed forward steadily with the party, till he observed a few yards in his front, an outpost drawn up across the road. The sappers now halted, and the two parties strained their eyes in surprise at this unexpected proximity. Morant, who was intently looking about him, struck against a wooden pillar of some altitude, streaked with painted bands of alternate black and white—supposed to be a milestone. By this his conviction was settled that the Russians were facing him. Alarmed at the visit, the enemy's picquet fell back on the main body, and Morant just then gave orders for his men, who were unarmed, to retire stealthily. This was done for a short distance, when turning about, the whole batch, as if winged for the occasion, run the gauntlet for their lives between the two hill picquets, relieving themselves as they fled of such encumbrances as were likely to impede their haste. In this way their greatcoats and wooden canteens, in part, were left behind; and as the distance between the parties was inconsiderable, and the fire from the

different picquets sharp upon the sappers, it is somewhat extraordinary, that not a man was wounded so as to draw blood. Several had their greatcoats, trousers and jackets perforated or torn by bullets, and a few were grazed on the legs and arms, while the sergeant had a choice lock of his hair clipped off, and a slight touch in the cartilage of the left ear.³

This mishap was not without advantage, for it frustrated the execution of a sortie which was then preparing. From the flashes of the Russian fire, strong battalions of infantry could be seen moving towards our works, to repel which the second and light divisions at once turned out; the riflemen too, always ready, poured a destructive fusillade into the advancing battalions, and the artillery, never from their posts, saluted them with volleys of shot and shell. For nearly an hour the combat lasted, when the enemy, flying before the rush and cheer of the 88th, took shelter under the walls of the fortress, keeping up, however, for the rest of the night, a desultory fire upon the works. The loss in the trenches was trifling, and our batteries, which were much exposed, remained intact.

Notwithstanding this attack, the new battery was considerably advanced in its construction before the morning, for no less than 840 gabions had been laid in it during the night by lance-corporal George H. Collins.

A few nights after the mishap stated above, the non-commissioned officer just named was selected to conduct a working party to the 21-gun battery. It was exceedingly dark, and the men moved on cautiously. The "valley of the shadow of death" had been crossed; the picket-house passed; indeed the greater part of the journey had been marched when the field-officer in charge expressed his doubts that the proper track had been taken. To remove the officer's misgivings and to prove the correctness of his own conduct, the corporal offered to go alone

³ On the 18th October a 15-inch shell, termed "Whistling Dick," struck the roof of a magazine in the 21-gun battery, and, in exploding, knocked down sergeant Morant and corporal George Pearson, burying them under a heap of sand-bags. The corporal soon struggled to his feet, but the sergeant, more severely stunned, was pulled from the mass by Lieutenant Murray of the engineers.

to the battery, which, regarded as the wiser course, was at once approved of. Off started the guide, and having reassured himself by a visit to the work, that his direction was right, returned to the officer within a quarter of an hour. To regain the party was more difficult than he anticipated. He knew not the relative position of the point where the halt was called, and on coming back bore away to the right about 200 yards. He judged by the time he was absent that he must be near the workmen, and so hailing them by whistling signals, which were recognized and answered, he was extricated from a dilemma it would probably have taken the night to solve. Satisfied with the integrity of his guide, the field-officer now readily moved on the column as Collins led, and soon reached the battery. The work was afterwards known by the name of the "Gordon Battery."

By the 16th October the vigilance of the working parties had placed the lines in so forward a state that, on the following evening, orders were issued to the troops respecting the bombardment. No exertions were spared throughout the night to complete the works in every detail, and the sappers, being told off into storming parties of twenty men each under an officer of the corps, were attached to the several divisions of the army to lead the way in any enterprise in which their professional services might be demanded. For this purpose they were furnished with picks and shovels to form lodgments; crowbars, felling-axes, and sledge-hammers to remove impediments; bags of gunpowder for blowing in gates; and scaling ladders with which to storm walls and towers.

Eight or more distinct works had been erected, mounting above sixty guns, including Lancasters, which, during the siege, were increased or diminished according to circumstances. They were connected with a line of excavations exceeding a mile in length on the right, and 1,200 yards on the left, including deviations offered for acceptance by the undulations of the hills. The chief batteries—named after the officers of engineers who superintended their construction, held a position on the heights at a distance exceeding 1,350 yards from the

Russian lines, while the French, working in easy soil, pushed up much nearer to the fortress by the usual process of sapping and mining. On the part of the English the plan of attack was necessarily a departure from recognized rules, owing to the rocky character of the ground and the deep glens which separated the works.

On the morning of the 17th, there were, including the sick, 351 non-commissioned officers and men in camp and in the trenches. As many as could possibly be collected were sent to the batteries to share in the first day's bombardment. Under cover of the darkness, the embrasures of the batteries, blinded with gabions, were quickly unmasked by the sappers, and before the dawn had fairly opened, sixty-three guns belched their fire upon the fortress. By a preconcerted signal the French, hurling destruction from fifty-six pieces of ordnance, commenced the siege simultaneously with the English, and the allied navies took part in the contest. This was the first day's firing on the part of the besiegers; and although the garrison kept up a warm cannonade upon the allies from the moment that any show was made in the construction of the trenches, the Anglo-French never once attempted, by the discharge of a single piece of ordnance, to lessen the interference of the enemy, or to interrupt the progress of their defences.

From both sides the cannonade was continued with more or less vigour according to the nature of events, and the result evidenced only too plainly the devastating effect of the firing. Our batteries were much damaged; those of the allies were scattered, whilst two of their magazines blew up with mournful results. The works of the enemy were in some places almost demolished: their firing varied as they found cover to stand to the guns; but the day's fury was at length terminated by the terrific explosion of a magazine behind an earthen redoubt, which threw a feeling of awe even among the besiegers. There was much skill, however, in the Russian engineers, and before morning, by extraordinary exertion, the works were restored and replaced with guns. No less energetic were the English sappers in strengthening the lines and repairing the batteries;

for although erected with admirable solidity, the shells from the fortress ploughed up the works and tore down the embrasures. In all such cases, if the restoration could not be deferred till night, the sappers, with a daring equal to their usefulness, would spring into the openings, and while exposed to the hottest of the fire, make good the breaches. One of the bravest and best in this exposed service was corporal John Paul. Fortunately, in the early stages of the siege, repairs in open day were seldom imperative. The damages done in the day by the cannonading of 155 guns were expeditiously made good at night; and so efficiently, that each morning the batteries stood up as compact and bold as they did before the firing opened on the 17th October.

After the first day's firing, Sir John Burgoyne thus wrote to the Commander-in-chief. "I would call Lord Raglan's attention to the great and successful exertions of the royal engineers and sappers under very trying circumstances. The very rocky soil presents the extreme of difficulties to the establishment of trenches and batteries; the very act of obtaining cover in one night in such soil, which was done on every occasion, requires a great effort, and to construct in it substantial batteries, still more.

"The proportion of good platforms and stuff for magazines embarked, was too insignificant to be worthy of notice: these objects had to be prepared (and for a very heavy description of ordnance) from the irregular masses of timber and plank that could be procured from buildings pulled down. Notwithstanding all these difficulties, the work has been pushed on with rapidity, the substantial nature of the parapet has been proved by the few casualties incurred, and the embrasures and platforms have required, during the very heavy cannonade of yesterday, less repairs and adjustment than I have ever been witness to on similar occasions; and no accident has occurred to any magazine, although some shells have been observed to explode on them, all proving the substantial goodness of the works performed."

1854.

SIEGE OF SEBASTOPOL.

18th October—31st December.

A corporal guides the field officer to the 21-gun battery in open day—The last shot—Two sappers mend a gap of some magnitude in a mortar battery—Scarcity of soil and materials for carrying on the works—Picket-house battery—Mishap to a tracing party—Platforms—Magazines—A detachment with arabas moves from the valley during the battle of Balaklava—Private Lancaster the only sapper engaged in it—Steady conduct of the sappers at the platforms during Sir De Lacy Evans's combat—Battle of Inkermann—A corporal gallantly alters the splay of an embrasure while the fight rages—Sappers trench the road leading to the heights from the harbour—Two privates repair an embrasure under a severe fire—Submarine divers—Progress of the works—Hurricane of the 14th November; wreck of the 'Prince'—and the 'Rip Van Winkle'—Effects of the storm on shore—Lines of Inkermann—Mode of proceeding with the construction of the general works—Strength of corps at the siege and detached—Field electric telegraph—Sergeant Anderson—Casualties—Sergeant Drew—Arrival of second company; its colour-sergeant taken for a Pacha—Incentives to induce the Turks to work—The Navvies—Army Works Corps—The sappers, though under a seeming cloud, are upheld by a vigorous vindication in Parliament.

NEXT day the bombardment continued to rage, and Colonel Hood of the Grenadier Guards, the field-officer of the trenches on the right attack, was killed. He was succeeded by Colonel Walker of the Scots' Fusilier Guards. Corporal George H. Collins, chosen as a sure guide, went off with the colonel, passing from the engineer park by the sailor's camp into the ravine. They then took the Woronzoff road at a run for nearly half-a-mile, and arrived at the foot of a rocky watercourse leading to the hill on which was situated the 21-gun battery, where the colonel dismissed the corporal, and dashed on alone into the work. In going, shot and shell fell furiously into the valley, requiring a sharp look-out to keep clear of splinters. It was even worse in returning; for as the corporal's back was turned

to the fire, he barely allowed himself time to see what were his chances of life and death. Considering that his risks increased by delay, he bounded along the tortuous and broken road, stopping now and then to take breath and cover under some low rocks which jutted from the hill side; and then, pushing up the other slope of the ravine, marched into the camp unhurt. One might have thought that a service of this nature would have excused the corporal from a tour in the trenches; but such was the pressure for sappers, it could not be. At night he was on duty in the Gordon parallel, and four days later was grazed in the back by a shot, which, after striking the earth, rushed past him, and knocked him senseless.¹ He was superintending at the time a party working in the right Lancaster battery, clearing away the rock for a platform.

Lance-corporal Rinhy, a ready and spirited sapper, was in No. 3 battery of the left attack on the 19th. Well had he worked that day in the embrasures; and at dusk, as the order was given to cease the cannonade, he went up to No. 6 gun to see the *last* shot fired. The sailors manned the gun, loading it with a Russian 26-pounder ball, which had hopped among the shot piled in rear of the parapet. The ball stuck in the muzzle, and while Rinhy and the seamen were vainly trying to withdraw it, another shot whisked through the embrasure, cut the man-o'-war's man in two, and striking the trunnion from the gun, the 24-pounder fell and smashed the sailor underneath it. The same shot passed so close to Rinhy, that it rasped a button from his jacket, and the ferocity of its wind knocked him against a traverse some five yards away. In the same battery, two or three days later, he repaired an embrasure no less than twenty-one times during his tour of duty, and kept the cheeks in such serviceable order, that the 68-pounder which fired there, discharged before nightfall as many as 198 shells and 84 shot into the Russian works, dismounting, according to nautical calculation, no less than six guns in the Redan.

¹ This corporal completed the tombstone placed over the remains of Colonel Hood and Captain Rowley; the latter was killed on the 16th. It consisted of a flat slab, which enclosed both graves; and a monumental cross at the head bore a well-cut inscription, which told of the melancholy fate of these noble officers.

Private William Denham was killed this day, while repairing a platform in the 21-gun battery. A shot carried away the back of his head.

Among the instances of well employed zeal that occurred in this bombardment, was one in which privates Jenkins and John Wallace signalized themselves under the eye of Major Biddulph, of the artillery, assistant engineer. They were stationed on the 22nd in No. 3 battery left attack, against which the fire of several guns was concentrated with so ruinous an effect, that about fourteen feet of the parapet was broken down before ten o'clock in the morning. To venture into so exposed a gap in broad day, under a frightful fire, needed a courage which few men could prevail on themselves to exercise; but with a willing promptitude which spoke of their resolution and daring, these two stern sappers passed into the breach, each working for a quarter of an hour at a spell, with the strength of a giant. In seven hours the damage was mended, during which the battery continued in action, though a mortar or two was necessarily silent until sufficient cover was obtained to shield the sappers fighting there.

Everywhere the soil was scanty, and the materials for gaining cover scarce. The few houses that existed in the vicinity of the camp had early been demolished, and the old timbers borne away for fuel. Brushwood and young trees, wherever they could be found, were also taken away; and when the cold became extreme, and the ration wood reduced to a few sticks, the ground was turned over in every direction, by perishing men, to collect the roots for firing. Earth was brought from the rear, in baskets, to fill the gabions; and sand-bags, ready for use, were also brought from the park, or wherever the earth could readily be obtained. As they frequently caught fire and burst on the explosion of the guns, a substitute was found for a time by making the bags from the skins of sheep and from bullocks' hides, which stood remarkably well, but they could not be procured in sufficient quantity for the work. The inner necks of the embrasures were revetted with sand-bags and the cheeks lined with fascines. The basis of all the works was the gabion. In places not opposed by artillery, stones were used

for lining the trenches, which gave them the appearance of ancient walls. The traverses were revetted with old gabions, discarded casks, worn biscuit-bags from the fleet, and ammunition cases. Indeed every material was pressed into the siege that could be turned by ingenuity to any useful purpose. On all sides the works exhibited a curious employment of rude expedients and adaptations to meet the straits and difficulties of an unexampled attack.

With all these shifts, from the inadequacy of material resources to carry on the works, such was the recklessness of the soldiers in seeking means to afford them a modicum of comfort, that the sand-bags were constantly abstracted from the trenches to line their trousers and gaiter their legs; and when wood could not be readily procured, they made no scruple in frosty weather, of purloining fascines and gabions to light their fires. Mandates against such practices were disregarded, and vigilance was no match for men driven by cold to such extremities.

On the 24th October, a battery for three guns and a 10-inch mortar was opened on the left above the picket-house to destroy a two-decker lying snugly in the inner harbour. A few red-hot shot being sent into her, she hastily moved off, and the battery was quickly turned to swell the general armament against the enemy's land works.

The same night two privates were out in some advanced works tracing a battery under Major Gordon. When returning by a whistle-signal from the Major, they were mistaken for Russians, and fired upon by a party of the 79th Highlanders. The result was that private James Bland, a good sapper, was struck down by a rifle-shot which passed through both his thighs.

It was not long before the Madras traversing platform, considered to be the specific for a great siege, was shown to be a failure. From the hard and uneven bottom of the trench the platforms were, to save them from injury and secure their efficiency, laid upon sand-bags well tamped, but the violent and sudden action of the guns in their recoil shivered the platforms to pieces. A rude substitute was expeditiously furnished by

tearing down some dilapidated wooden houses in the neighbourhood of the camp; and resorting to the old expedient of sleepers and floors, the platforms, so prepared by the sapper carpenters, were found to be far less liable to derangement than the engineering exotic from Madras.

While the Russians and our allies experienced very heavy losses in the destruction of their magazines, no accident whatever occurred to the English powder-magazines, "although more than once exposed to the test of the fall and explosion of a 12-inch shell."² Offering, as the record does, a tribute of credit to the efficiency of the contrivance, it is no less a testimonial to the skill of the sappers, who, in consequence of the special nature of the service, constructed the magazines themselves. The magazines on the left were constructed on the established model, in places assigned to them by the old engineers, but on the right the ammunition was dispersed in sheltered spots in small receptacles attached to the parapets of the different batteries. The large dépôts of ammunition were formed in the caves of the neighbouring ravine; and all the magazines were well protected by sand-bags.

On the 25th October was fought the memorable cavalry combat at Balaklava. Sergeant Joseph Morant and six privates, having in charge thirty Turkish arabas drawn by sixty bullocks, had nearly passed the valley with the train when the fight commenced. The escort was moving to the port for stores, and several of the waggons still within the boundary of the battlefield, were swept and pierced by shots from the Russian artillery. As this was no place for a cumbersome train of conveyances, Morant and his men goaded and whooped on the oxen to Balaklava; and speedily loading the arabas, returned, after the action, to the engineer park in front of Sebastopol. These seven sappers and eleven others who were in the vicinity of the battle, were honoured with the distinction of the Balaklava clasp.

There was only one sapper actually engaged in the battle. Sir Colin Campbell, anticipating an attack, ordered an able sapper to be sent to the Turkish redoubts to superintend any

² 'Quarterly Review,' vol. xcv., p. 239.

repairs that might be needed. Sergeant Dickson despatched private James Lancaster for the duty. At five o'clock on the evening of the 24th, he arrived at No. 4 redoubt, situated close under the hills of the plateau where the corps d'observation of General Bosquet was encamped. All night Lancaster worked with the Turks in strengthening the faces of the redoubt; and in the morning stretched himself in a shallow trench to take a little sleep. He had not long covered himself with a tarpaulin—a cold substitute for a blanket—when the Russians attacked No. 1 redoubt, which was a considerable distance from No. 4. Instantly awakened by some Turks, who seemingly wanted an Englishman to keep alive in them the little valour they possessed, he was quickly among them. There was also a British artilleryman in the redoubt, with whom the sapper, sharing the kin of country, behaved as became their national prestige. While the cannonading was doing its work on No. 1, a Russian battery pushed up to a height opposite No. 4, and opened its guns on No. 3. The attack was sharp, but the Turks wanting spirit and firmness, made a weak defence, and flew from the fort. In time Nos. 1, 2, and 3 were taken. When the guns in No. 3 were silenced, the Russian battery increased its fire on No. 4, which answering with an energy probably emboldened by the nearness of supports, checked the enemy in his career of success; and though No. 4 might easily have been captured, it escaped the fate which sealed the others. It is due to the gallantry of the Turks in No. 4 to acknowledge that while many of the infantry vaulted in alarm over the parapet at the first blush of the fight, and ran from the opportunity to cover themselves with honour, there were not wanting stanch artillerymen, firm and courageous, to stand to the guns; and, as instructed by the British gunner, to work them manfully. The Pasha in command was an old but a brave officer, and his worst trouble was to beat back the flying Turks to join in the defence. The enemy now commenced another movement by collecting on the heights overlooking the plain between the redoubts, the whole strength of his cavalry—a solid menacing body, which in its heaviness threatened that day to strike a decisive blow. Meanwhile

the Turks in No. 4, regarding any display of courage on their part as useless, and their position untenable, withdrew the two guns to the rear, halting them on the crest of a slope; and after spiking the ordnance and breaking the spokes of the wheels and the shafts of the carriages, tumbled them into the valley. The garrison then retired to the position where the Highlanders were drawn up. The artilleryman and sapper stood by the Turks to the last, but in the retreat each took a different direction. While sitting in the valley a short distance from the redoubt, Lords Lucan and Cardigan with their staff galloped up to the sapper, and grouped round him. Learning the cause of his presence there, he was asked what he knew of the attack. Lancaster answered to the effect that two of the forts had already been taken, and the others, having been abandoned, would, he feared, soon follow. Away rode the commanders and the staff; the trumpets sounded, and removing the cavalry behind a mound, soon after occurred those cavalry dispositions, and that extraordinary conflict, which prevented the Russians from pouring into Balaklava, and capturing the great base of the allied operations. Private Lancaster succeeded in making good his retreat, under a heavy fire, without mischance.

Neglecting to erect earth-works to defend the right of the position towards Inkermann led to an attack by the Russians, which was met and repulsed with vigour on the 26th October, by the division under the command of Sir De Lacy Evans. The sappers turned out and marched to Victoria Hill, in readiness, if required, to take part in the action. A portion of them was posted behind a rubble wall in "Water" Valley, which was loopholed during the fight; and four men were in the 5-gun battery. The usual parties were also distributed to the trenches, working away in the different batteries as if the combat were at a distance. The fire on the 21-gun battery was very sharp, but under its fierceness a brigade of carpenters, directed by corporal Kester Knight, repaired a platform no less than five times in the course of two hours. It was broken each time by the heavy recoil of the gun. Once, while mending it,

a shot plunged through the embrasure and shattered a wheel of the carriage; but looking upon the incident almost as one of the civilities of the siege, the carpenters continued to work vigorously till they had obtained something like the desired solidity.

Another attack followed on the 5th November, in which the English and French, numbering about 14,000 bayonets, were opposed by an army of nearly 60,000 fighting men. For upwards of ten hours the conflict lasted, and ended in a victory to the allies, while the Russians, driven from the hills at all points, took refuge in flight. The losses in the Anglo-French ranks were very severe, but those of the enemy, incredible as it may seem, far exceeded the total force of the allies engaged. This splendid achievement, in which the soldiers stood against overwhelming odds with unconquerable firmness and bravery, will ever rank in the annals of war as one of the most remarkable struggles of modern times. Occupied in the trenches, and forming a guard over the engineer park, the sappers and miners did not fire a shot in either of the engagements. They were, however, drawn up while the fight at Inkermann was raging, prepared to defend the siege dépôt had the Russians penetrated to the engineer plateau. Being in position during the battle, the sappers and miners have been considered entitled to the Inkermann decoration, and 341 non-commissioned officers and men of the corps present on the occasion had the honour of receiving the clasp.

Though the night was thick and foggy, the Russian columns were seen surging towards Inkermann from the Mamelon. None of our siege guns could be brought to bear on them; and as it was considered an object of the first moment to rake the masses, orders were given to alter the embrasure of a gun in the old right Lancaster battery, beyond the right of the first parallel. Lance-corporal Trimble, a young and agile soldier, had charge of the two embrasures in the battery, and had with him four men of the 47th regiment to assist in the repairs. No sooner was the decision communicated to the corporal, than he leaped into the opening, followed by his party. Gabions, barrels, fascines,

and sand-bags, quickly disappeared ; all were thrown or pushed into the ditch in front of the battery, as the readiest means of performing a service from which so much was expected. Then commenced the reformation of the splay by cutting away full half of the merlon on the right cheek, which separated the 24-pounder from the Lancaster gun. When finished, the embrasure had a skew form, with a widened mouth ; but as the service was pressing, and the artillerymen impatient—for twice did they stop the work to try the effect of a few rounds—it could not be revetted, and the parapet was necessarily left without a gabion to bank up the earth. The 47th men took a bold and active part in the service, and within an hour, under a fire that would have made many a head reel, the corporal and his men completed the alteration. Barely had they jumped from the opening, when the gunners recommenced a cannonade from the Lancaster which made deadly gaps in the Russian battalions, as in winding round the Mamelon they retreated to their own lines. For their assistance in this hurried duty, one or two of the linesmen were made corporals and decorated with medals ; and Trimble, though his rewards were deferred, was promoted to be second-corporal, and honoured with a special gratuity of ten pounds and medal for gallant conduct.

From the stern grandeur of the battle, it was not improbable the attack would be repeated, when, in some degree, the Russians had recovered from the shock. To render an approach less likely to succeed, Lieutenant Ravenhill and a party of sappers repaired to the heights to destroy the road winding from the head of Sebastopol harbour up the ravine to Inkermann. This was simply as a first defensive resource, to be followed by regularly planned works. The hill-top and its slopes were covered with killed and wounded, among whom perhaps the sappers might have performed any amount of duty without accident ; but possessing a settled distrust of the honour of the Russians, they first collected all the arms they could see within sixty yards of their work, and broke them in pieces. Thus relieved from a temptation to which the vanquished in their hatred have been known treacherously to yield, the sappers moved to

the site of their work, and in eight hours dug a trench across the road eight feet deep and twelve broad.

A few nights later, privates Charles Harris and Nicholas Garrett revetted an embrasure in the 21-gun battery, which had been torn to pieces in the early part of the morning. Shot and shell frequently fell into the work, but the sappers swerved not from the peril it seemed impossible to escape. Lieutenant Murray stood himself in the aperture to relieve the men of the necessity for watching, and warned the two gallant fellows when projectiles were approaching. In such instances, to lessen the chances of risk, all three threw themselves on the sole of the work, and, when the danger passed, resumed the revetment, quitting it only when the embrasure was finished.

When the Russians learnt that a descent was to be made on the Crimean coast, they sank several of their large war vessels and blocked up the passage into the harbour of Sebastopol. Since nautical skill and manœuvring were confessedly unequal to master the difficulty, submarine blasting was proposed as the readiest and most effectual method, and four sapper divers, selected from volunteers at Chatham, accompanied by the necessary apparatus and stores, sailed in the 'Prince' on the 27th October, and arrived in the harbour of Balaklava on the 7th November. Several other sappers, then before Sebastopol, who had been practically trained in the art by actual service in the demolition of the wreck of the 'Royal George,' were to have been engaged in the perilous duty.

On the 11th November was commenced the second parallel on the left attack, 360 yards in advance of Chapman's battery. The ground presented a surface of interminable rock, which caused the soil, as before, to be brought from a distance to form the parapets. The labours of the sappers were confined chiefly to mining the hill and blasting the rock, and also placing the gabions in position. Some 350 yards in front of the new parallel a row of Russian riflemen was established, who picked off the guard of the trenches with fatal rapidity. A dash was made for the pits on the 20th, which, after a smart little

combat, were captured and occupied by our light troops. The holes were afterwards connected by boyaux to the second parallel. On the right attack a place of arms was formed to shelter the troops when drawn up for assault. A long boyau was run out half way to the intended spot, and the centre portion of the parallel was thrown up by flying sap. Communications being also effected with the rear by means of a double set of approaches, guns and cohorns were mounted in the batteries to defend the stormers and play on the works. This new formation afterwards took its place in the series of trenches for the second parallel.

For two or three weeks the weather had been unpropitious. Snow was upon the ground, and sometimes rain, sleet, and hail varied the inclemency, while frost intervening, nipped the men with its cold grasp, and added to their sufferings. The prevailing aspect of the clouds was gloomy and lowering, but there was nothing to indicate the approach of that memorable storm, which on the 14th November, swept over the Black Sea and the Crimea. Early in the morning the hurricane began its portentous howling, and it was not long before it committed terrific havoc at sea. Ingenuity and precaution did much to save the ships from disaster, but many of the transports, too soon becoming unmanageable, were engulfed as by a spell in the raging surf, or broken to pieces on the shore. Among these was the 'Prince,' a magnificent steamer of heavy tonnage, freighted with winter clothing for the army and the diving machinery. For two hours she stood bravely against the storm, but at length driven against the rocks at Balaklava, her timbers were rent in every direction, and she went down. The four sapper divers on board of her, sergeant William Carne, and privates Samuel Lewis, Thomas Price, and Thomas Toohey, sank in the wreck, as also Captain W. M. Inglis, who had been observed on a spar struggling to gain the shore, when a wave of foam broke over him, and he was seen no more.

A like fate attended the 'Rip Van Winkle;' and the two sapper photographers—corporal John Pendered, and lance-

corporal John Hammond—well educated and trained at great expense in the art, perished in the foundered vessel. The knapsacks and kits of the eighth company were also lost.

On shore the hurricane was not so calamitous, but the tents were all torn up and blown to a distance. Only one solitary marquee remained to mark the site of the encampment. In common with the army the sappers and miners felt the shock of the storm, and were left shivering on the heights, unclad and comfortless. Those in the trenches experienced equal misery, but their zeal in the prosecution of the works was only checked by the fury of the raging wind and the deluging rain. The road to Balaklava soon became one long morass, and both man and horse, in travelling to the port, had to wade the distance up to their knees in mud. From this time the suffering and privations of the troops considerably increased in extent and severity; but, borne with uncomplaining endurance and fortitude, earned for them the abiding admiration and sympathies of their countrymen.

Two days after the conflict at Inkermann, parties of the corps were allotted for the duty of raising appropriate field-works to protect the right, which, shortly after, were increased by the fourth company encamped on the heights. Ill able to spare the men from the general works, the seventh company under Captain Gibb was removed from Gallipoli to take part in the operation. Arriving at Balaklava on the 28th November, the company reinforced the camp before Sebastopol on the 2nd December. Until the 17th, it was employed in the work of the trenches forming the 'right attack,' but on the following day it moved to the heights of Inkermann to complete the approaches against the town, and to erect batteries to oppose those of the enemy on the side of the Tchernaya. The fourth company being relieved, was returned to the operations of the right attack. At these lines the sappers, whose numbers varied between 58 and 31, worked only by day, except in a few special instances when the firing of the enemy was too hot and accurate to admit of day labour being carried on with any chance of success. The chief of their work was performed in the parallel, *Redoubt du 5me*

Novembre, and the Mortar and St. Laurent's batteries. They also laid the platforms, formed the embrasures and traverses, and restored them when injured. Two magazines in the St. Laurent's battery, constructed by the French of indifferent rubble, were so damaged by shells that both were rebuilt by the English sappers in a servicable style, with a roof of sand-bags and fascines, covered with a thick substratum of well-tamped earth. Relieved from duty one afternoon, the party was thrown into the trenches at night to level the top of the parapet. Though few in number, they worked with so much energy, that the object of their employment was fully accomplished in the darkness. Another night they crept down into the glen on the right, and tearing down some Russian houses, the timber brought away with them was afterwards turned to account for platforms, &c. In the general business of the trenches they were much impeded by the severity of the weather. The depth of the snow almost baffled them; but by removing it day after day from the interior of the lines, they made commendable progress in the batteries. Blasting rock was one of their ordinary duties; and after the 21st January, when the line troops were wholly withdrawn, the sappers were the only British soldiers working in concert with the allies. A 24 lb. shot struck one of the tents of the seventh company on the 4th February, and, singularly enough, glanced off the canvas without occasioning any casualty. After completing the Mortar battery and perfecting the details of the St. Laurent, the company, on the 7th, quitted the heights, leaving the works solely to the French.

As the siege wore on, it was found advantageous to make each relief commence its allotted labour at the most advanced point, and work backwards. The infantry parties usually opened ground as far as practicable, using straw baskets to gather earth for cover in places where it was insufficient. Wherever the pick was used it struck upon rock, which offered an unfailing obstruction to the progress of the lines. The sappers invariably followed these surface pioneers, and blasted or removed the stony portions. "In this service," it is recorded,

“ these men’s exertions have been altogether invaluable, and such as could not be supplied from any other part of the army.”

On the 1st December the strength of the corps in the East was as follows :—

	No.
Present at the siege and effective	401
Sick in field hospitals	40
Balaklava	23
Bucharest	14
Varna	17
Gallipoli	11
Constantinople and Scutari	18
Total	524

A feeble force compared with the extreme exigencies of the period.

Two sappers in charge of the field electric telegraph for service in the Crimea, arrived at Balaklava on the 7th December, and repaired to the camp on the 19th, taking with them the instruments, batteries, insulated wire, and appliances, packed in two waggons. Twenty-four coils of wire, each a mile long, were packed in them, as also a subsoil plough, appropriate tools, and boats. The apparatus, only available for short distances, was worked by six or eight men. To establish a communication between any two points, the wire, which uncoiled from a drum, revolving horizontally in a carriage drawn in advance, was laid in a shallow trough made by the plough, which served the double purpose of cutting the furrow and depositing the line. The trough was just deep enough to protect the wire from ordinary accidents. Equally effective was the apparatus for communicating with vessels at sea. The two sappers were specially instructed in the electric telegraph establishment at Lothbury in the mode of working the instruments, laying the wire, and in the ingenious manipulation required to give effect to the process. Such, however, was the state of the weather from snow storms, hard frosts, and heavy rains, it was some weeks before the telegraph could be employed. Meanwhile, as the instrument was regarded as an important appendage

to the army, sergeants James Anderson³ and Montgomery, with several non-commissioned officers and privates, were educated in the art by corporal Peter Fraser; so that when the time arrived for using it, there was an adequate staff of operators to attend to its scientific details and requirements.

Up to this period, in addition to the casualties already mentioned, the following men were put hors de combat:—

Private James Dilling—killed, by the bursting of a gun

The wounded were—

Private John McLean—slightly, in the head, by the bursting of a shell.

" James Wheeler—severely, in back of head and right shoulder, by splinters of shells.

" William Haines—severely, in back, by a spent 32 lb. shot rolling over the parapet on him.

" John Hutton—slightly, in the head.

" John Giles—severely, in left clavicle, and collar-bone broken, by grape-shot. After returning to England had a severe attack of small-pox, from which he recovered, but lost his right eye.

" Robert McFarlane—dangerously, in the thigh, by splinter of shell.

Sergeant James H. Drew—dangerously, in the left shoulder and collar-bone, by a shot.⁴

Private Samuel Coles—killed by a round shot, which struck his left shoulder, and carried away his arm.

Lance-corporal William Eastley—severely, in left leg, by splinter of shell.

³ This non-commissioned officer wrote some graphic and interesting letters about the siege, in one of which he says,—“After setting my working party to their task in the trenches, I went to the front to show corporal Kirkwood—a new arrival—the extent of our works, and to give him an introduction to Sebastopol. The trench in some places not being deep enough to cover us, we sometimes had to run along the top, and whenever we did so, the enemy peppered us well with grape and rifle bullets at about 300 yards. So I borrowed a Minié rifle from the 38th, and returned the compliment. This was the first time I had ever fired at a human being. Two 38th men loaded for me as fast as I could fire, and we soon cleared the embrasures of the Russian gunners; but they shot my comrade—a sergeant of the 38th—at my side. I bound up his wound with my handkerchief, and fired away again with his rifle. I have had many narrow escapes and much hard work, but I feel truly thankful to the Almighty for having brought me through all without a scratch. I hope soon to write to you from the imperial barracks *inside* Sebastopol. I hope,” says he, again, “we shall soon be allowed to storm. I could lead a party in by a short cut that I know of, and I think it would soon be over and the place ours.” The letters from which these extracts are taken were kindly lent for my perusal by an officer of the corps.

⁴ Was a well-educated and an active non-commissioned officer. For many years he was the confidential clerk of Sir Frederic Smith at Chatham, where,

The second company of 113 strong, under Captain King, reinforced the corps in the Crimea on the 20th December. As the weather was severe and the road to the camp almost impassable, the company was attached to the invalid battalion at the port. Considerations for its convenience did not, however, long prevail, for the want of sappers at the siege brought an order from Lord Raglan to remove the company on Christmas-day with its camp equipage and stores to the right attack. To assist the men on the march his lordship sent 150 Turks to meet them at the French barrier near Kadikoi, guided by sergeant Ramsay and another sapper who had reached the rendezvous before the company. The arrival of the new sappers elicited no concern from the stolid Turks, who, seated on the ground, smoking their fuming chibouks, declined to attend to any orders which should impose on them the labour of carrying the stores. Captain King did his best to beguile their obedience, but without effect. It so happened that colour-sergeant Brown of the company, who had been in Syria, had picked up a smattering of Arabic and knew something of the native idiosyncrasy. Permitted by his captain, he tried to win the acquiescence of the Turks by appealing gestures and the stammering out of a few imperfect words, which must have grated on their ears as so much jargon: but his best arts, either to force or delude them, failed to dissipate their obstinacy. In the meantime he told off the officers and men to their duties. Brown wore on his breast three medals, one of which he had

associating himself with a temperance society, he became an able advocate of its principles, and received from its members a silver medallion in testimony of his talented lectures on the subject. After serving a few years at Malta, he was sent to the Crimea; and in the trenches before Sebastopol, earned the good opinion of his officers for fearlessness, ability, and success as an overseer. At that time he was considered the ablest and readiest sergeant of sappers in the front. On the 10th of November he was wounded at the siege by a shot striking his shoulder, and breaking his collar-bone. The wound was an eccentric one. It did not draw blood, but made an insignificant contusion on the shoulder, from which it was expected that the injury was slight. It turned out otherwise. Removed on board the 'Avon,' he was much shaken in the storm of the 14th, and died a few days afterwards, on the 17th of November, off Scutari.

received from the Sultan for services in Syria. On its reverse was an Ottoman inscription, similar to the standard impression on the Turkish money. Curious to know the history of the medals, a young officer of the detachment stepped up to the sergeant, and handling the decorations, was surprised to find that one of them was the gift of the Sultan. Naming the fact to a group of his brother-officers, it quickly spread among the men, who, thinking that Brown was invested with authority from his Majesty, bounded to their feet, loaded themselves like mules with the equipage, and paced away with their burdens at a warm and earnest rate, stopping not, though fatigued, till their arrival at the sapper camp before Sebastopol. What was more remarkable in the affair, was the refusal of the Turks, though indisposed to give their labour without adequate compensation, to take tickets for working pay. Lieutenant Ewart, at a loss to conjecture the reason, whether to ascribe it to disaffection or disinterestedness, was not a little tickled when informed, that the demonstration arose from the Turks regarding the sergeant as a pacha.

In the early part of the siege, from the afflictions of a hard campaign, great difficulty was found in procuring a sufficiently strong party from the line for trench duty; and to make up for the deficiency a regiment of Turks, quartered at Balaklava, was appointed to the front. From their idle habits and indulgences, seldom could more than 400 men be brought together for work, which number was still further frittered away by disease and death to about 200. From the lack of land transport this force was usually absorbed in the carriage of stores to the batteries. To stimulate them to exertion, the sappers who superintended them were empowered to give such of their parties as deserved it, a ticket for pay, or even two, if their zeal were conspicuous; but to withhold the recognition, if from indolence they did but little to further the service. A sergeant of sappers—who was cashier and paymaster—always gave a day's pay for every authorized ticket presented to him; and this system, acting like the prick of a spur on the sides of a sulky hack, moved them to the exercise of an amount of effort which it would have been

next to impossible to have wrung from them by any other scheme.

Reduced when hostilities commenced to the minimum of peace requirement, the sappers, whose duty it was to execute any description of work which war or the elements might originate, were unable to spare a man from the trenches for the pressing services of the rear. The troops of the line, decimated and exhausted, were utterly inadequate to meet any extra contingency; and thus arose a crisis in the affairs of the campaign which led to the gravest considerations and misgivings at home. So terrible had been the weather, so destructive the storms, so complete the disruption of the communication between Balaklava and the camp—in consequence of the road having become a swamp—that no resource was left to the War Minister but to seek for remedies by the employment of novel establishments. At his call a corps of hardy navvies sprung up in a day, and controlled by civil superintendents, untrammelled by the rigours and nice exactions of military discipline, the Balaklava railway was commenced and carried through with so much despatch, that no one regretted the temporary creation of a force which in its wonderful zeal relieved the overworked and perishing troops of one of the most appalling miseries of the campaign.

So obvious were the benefits evolved from this experiment, that when the engagement of the navvies had ceased, the idea of perpetuating the existence of so useful a body in an altered character assumed a permanent form. Though ready, the navvies were rough and undisciplined, bearing no connection with the great military expedition of which they formed a part. This gave rise to the Army Works Corps, for the execution of all extra services not properly belonging to the battle-field, the trenches, or the operations of an army. It was arranged, it would seem, that their duties should embrace the construction of roads and drains, preparation of sites for encampment, erection of huts, &c. The pecuniary advantages offered to candidates were of such a high standard that an enthusiastic recruitment was the consequence. A few weeks were more

than enough to embody the corps, which consisted principally of navigators, and about a fifth of mechanics of various crafts. Overseers were engaged to superintend the gangs, with designations suitable to their avocations, and a civil engineer commanded the whole, with the relative rank of colonel. Later the force formed an important branch of the army. Fostered and shielded by the ministry, it was equipped with gear and working accessories of the most perfect and costly kind; and before the close of the war, it had grown into an authorized body of 3,470 officers and men, requiring for its sustenance in strength and efficiency no less a sum for one year than 408,595*l*.

In time, the formation of this working force was much commented on in the House of Commons. While it was regarded—with insufficient reason perhaps—as a reflection on the efficiency of the royal sappers and miners, there were not wanting advocates—and none more earnest than members of the ministry, particularly Mr. Monsell—to vindicate the character of the corps, and to compliment it, in terms full of appreciation and praise for its usefulness at the siege, and its capability, with augmented numbers, of performing any amount of work which the terrible exigencies of storm or war might render indispensable.⁵

⁵ See Debates of 3rd March and 8th April, 1855. Also leaders in the 'Times' of 2nd and 23rd June, 1855. The leading article of the 23rd, while it vindicated the formation of the Army Works Corps as the readiest and best expedient under the circumstances of the pressure, and afforded reasons for assuming its superiority as a working force to the sappers, nevertheless made admissions which were highly commendatory to the latter.

1855.

1st January—8th April.

SIEGE OF SEBASTOPOL.

Sanitary state of companies—Warm clothing—Collecting detachments in England to forward to the siege—Services of party with Omar Pasha's army—Granted medals by the Sultan—Mishap on the Tchernaya—Destruction of the village of Inkermann—Exertions of sappers in the trenches during snow storms—Anecdote, Corrigan's charcoal—Obstructions to the trenches by mud—Arrival of first company—Hut stables for the cavalry horses—French build No. 9 battery; right attack—Conduct of corporal Lendrim—Sappers share of the work—The parallel—Huts—French sappers entertained at Southampton—Casualties—Reforming works to counteract enfilade fire—Nos. 7 and 8 batteries, left attack—Moving guns to the front—International parallel; zeal of non-commissioned officers—Destroying a rifle screen—Completion of the parallel—Death of captain Craigie—Sir John Burgoyne's farewell address—Sorties—Bearing in a wounded Russian—Augmentation to corps—Driver troop—Efforts to obtain recruits; militia men—Sergeant Docherty captured on suspicion of being a Russian spy—Countermine under cave magazine—Casualties—Zigzag from right rifle pit in advance of second parallel; wound sustained by a singular agent—Death of Lieutenant Bainbrigge—Third parallel, right attack—Progress of the works—Faintless energy of sappers in building a two-gun battery in the third parallel, left attack—Two corporals singularly escape from a shell which destroyed the magazine they were erecting—Embrasures of No. 7 battery opened—Preparations for a bombardment—The weather.

FROM the laborious nature of the duties in the trenches, the sappers were absolutely ragged, and as the frost had set in, late in December, with unusual rigour, it is surprising they possessed stamina and spirit enough to bear up against the exposure to which they were subjected. Nevertheless the sickness was trifling compared with the appalling details of casualties reported in other corps; for on the 1st January, out of a

strength of 639 non-commissioned officers and men, only ninety-two were in the field hospitals and at Scutari. Diarrhœa, fever, and frostbite were, however, very prevalent during the month, and the increase in the sick was considerable. In that period no less a number than 273 had been under treatment, exclusive of the invalids sent to the hospitals on the Bosphorus. The number available for the siege, including the sick present, was 519. The remainder were detached to Balaklava, the Monastery of St. George, Gallipoli, Scutari, Constantinople, and Bucharest.

As soon as it was determined to provide the troops with winter clothing, an ample supply was furnished for the sappers and miners at an expense of 4,260*l.*, which enabled the following articles to be issued to each man :—

- 2 pairs of worsted stockings.
- 2 pairs of woollen drawers.
- 2 pairs of woollen mitts.
- 2 woollen guernseys.
- 1 woollen neck-comforter.
- 1 blanket-cover.
- 1 railway-wrapper.
- 1 fur cap.
- 1 overcoat.
- 1 pair of long boots.

All the articles were excellent in quality, strong, warm, and adapted to the Crimean climate. Previous to the supply arriving, the sappers, to a certain extent, were furnished with buffalo skins for beds, heavy Turkish gregos with hoods for trench duty, rugs, Jerseys, &c.

Driven for men to send to the war, some of the stations by degrees were either wholly denuded of their forces or considerably reduced. The half company at Hong Kong was first removed, landing at Woolwich on the 3rd January. During its service in China its character was so uniformly exemplary that Sir John Burgoyne complimented the men in a general order. On embarking for England Captain Whittingham, the commanding royal engineer, made a flattering report of their conduct. "The proofs," he wrote, "are patent in the few deaths, in the few cases of intermittent or other climatal

diseases, and in the absolute cessation of courts-martial, although the ratio of exposure to a tropical sun—the engendering cause of disease and drunkenness—has been far greater than those of other troops and has almost exhausted the stamina of the men.” “Their extreme good conduct” was also the subject of a report from Lieutenant and Adjutant Lloyd, 59th regiment, who commanded the troops on board. A few years ago three privates superintended under the colonial clerk of works the erection of the Government offices. From December, 1852, three other men were employed under Mr. Cleverley, the surveyor-general, as overseers in building the Government-house; and on quitting the island, he testified to the very great benefit that had been derived from their supervision of the works. For more than eleven years a small force of the corps had served in China, the first party having landed in October, 1843. The total number which had been sent there amounted to 113, of whom 33 died, 27 were invalided, 1 was discharged in the colony and died, 7 deserted, 23 returned to England by reliefs, and 22 reached home on the final removal of the detachment from Hong Kong.

The small party at Spike Island was withdrawn the same month. Four months later the Melbourne detachment returned to England; then followed the seventeenth company from the Cape in July; and gradually Gibraltar, Corfu, and Bermuda were left with only invalid nuclei unfitted for the stern vicissitudes of campaigning but able for the works of the stations. A detachment of unmarried men was also ordered from the remote settlement of the Swan River, but arrived too late to share in the glories of the siege. This shearing, however, furnished but a unit of accessible sappers—for it brought to this country a number of men who required to be physically renewed before sending them on a hard service, where the trials of weather alone were likely to break them up without subjecting them to the severities of the trenches.

Two sapper divers landed at Balaklava from the ‘Robert Lowe,’ on the 4th January, under the command of Captain De Moleyns, having in charge Mr. Rendel’s loaded cylinders to be

applied for blasting the sunken ships at the mouth of the harbour.¹

The small detachment under Major Bent, of the engineers, joined at the camp about this time from Bucharest, marching with the Turkish army; and the following dispatch from his Highness Omar Pasha, so complimentary to its efficiency, was communicated by Lord Raglan to the Minister of War:—

“MY LORD,

“*Varna, January 8, 1855.*

“His Highness Omar Pasha has requested me to write to your Lordship, to return his best thanks for the services rendered to his army by Major Bent, of the royal engineers, and the detachment of sappers under his command.

“His Highness desires me to express his regret at the losses which have been sustained by this small detachment, who, under the direction of Major Bent, have well sustained the character of the British army.

“His Highness has already expressed to your Lordship his regret at the loss of Lieutenant Burke, of the royal engineers, whom His Highness considers to have been an officer of much merit.

“His Highness desires me to inform your Lordship, that he has done himself the honour to write to the Turkish Ambassador at the Court of St. James's expressing the desire of His Majesty the Sultan that private Andrew Anderson, of the royal sappers and miners, may receive and wear the decoration of the fourth class of the order of Medjidie, in commemoration of his gallantry in recovering the body of Lieutenant Burke, after he was killed at the passing of the Danube on the 7th of July last. In the meantime he has presented private Anderson with the decoration, and trusts your Lordship will allow him to wear it until the commands of Her Majesty may be received.²

“His Highness further desires me to express to your Lordship his entire approbation of the manner in which Major Bent has conducted his duties.

“He desires me to inform your Lordship that this officer showed great energy in his endeavours to enter Silistria before the siege was raised: that he subsequently showed great gallantry at the passage of the Danube, when he was the first to land on the left bank, and covered the landing of the Turkish

¹ The siege passed and peace returned without the chance of using them. Mr. Deane, the subaqueous engineer, was sent to the Crimea to carry out services in connection with his profession. After Sebastopol had fallen he recovered about thirteen guns sunk in the inner harbour. Private John Williams, an excellent diver, who had been employed at the ‘Royal George,’ under Sir Charles Pasley, pushed into the idle dress one day when Mr. Deane was away and dived, bringing up, as the fruit of his exertions, a brass 8-pounder field-piece and a gun-carriage, with harness for horses attached. This was the only opportunity, and a stolen one it was, that he, or any sapper, had of proving his efficiency in submarine operations.

² Granted by the Queen under authority, dated 12th January, 1855. See ante, pp. 185–187.

troops with a detachment of riflemen, who maintained their ground under a heavy fire until the disembarkation of the supports was effected.

"Major Bent and his sappers were subsequently of great service in throwing up the tête de pont at Giurgevo, and in the construction of the bridge across the Danube.

"His Highness desires to take this opportunity of expressing to your Lordship his high sense of the services rendered by Lieutenant Glyn, R.N., and H. S. II. Prince Ernest of Saxe Leiningen, with the detachment of sailors of Her Majesty's fleet under their command, in the construction of the bridge across the Danube.

"His Highness considers that the success of the construction of this bridge is in great measure attributable to their well-planned dispositions, which, although executed with limited means, proved fully effective to resist the storms and strong currents of the Danube."

"He desires me to say that he is fully satisfied with the zeal and energy of this detachment of Her Majesty's fleet under the able direction of Lieutenant Glyn, whom he considers a very promising officer, and entirely worthy of the confidence of your Lordship.

"His Highness desires me to add, that it would be very gratifying to him if Her Majesty could in any way reward these officers for the able services they have rendered to the Ottoman army and the common cause.

"I am, &c.

(Signed)

"Field-Marshal Lord Raglan, G.C.B., &c.

"J. L. A. SIMMONS,

Lieut.-Colonel."

This encomiastic testimonial was apparently insufficient to mark the appreciation of their military services, and decorations were added to commemorate the campaign. In the brigade orders of the 23rd July, 1855, the Sultan's gift was thus alluded to:—"The Turkish government having awarded a certain number of medals to the officers of royal engineers and the royal sappers and miners who were engaged in the campaign of 1854 on the Danube, the Major-General commanding has much pleasure in publishing the following extract from a letter addressed by his Highness Omar Pasha to Lieut.-Colonel Simmons, Her Majesty's Commissioner with the Turkish forces."

"I beg you will distribute these medals amongst the officers and men according to the accompanying list, as a mark of the great satisfaction my Sovereign has always experienced from the manner in which they conducted themselves whilst sharing

² The bridge was thrown, under the direction of Major Bent, by the sappers and miners, and a party of French pontoneers. The duty of the seamen was confined to the nautical arrangements for the undertaking, which comprised the labour of bringing the boats and securing them stem and stern.

the dangers and fatigues of the campaign of 1854 against our common enemy."

The non-commissioned officers and men who received the medals were—

Colour-sergeant . . .	John F. Read.
Corporal	James Curgenvven.
"	James Cray.
"	Joseph J. Stanton.
2nd corporal	Robert M. Rylatt.
Lance-corporal . . .	Michael Westacott.
Private	John Boyles.
"	John Bramley.
"	John Doran.
"	William Henderson.
"	Alexander McCaughey.
"	William Morrison.
"	George Scown.
"	William Allen.
"	James Bland.
"	John Piper.

These sixteen sappers were the only British soldiers honoured with the distinction.

There existed an intention for a time of attacking the enemy across the Tchernaya; but as the bridge which spanned it, stripped of its planking, was impassable, it was necessary, before providing an expedient for the passage of the troops, to ascertain the characteristics of the river and take its soundings. A portion of the seventh company had constructed a raft of four common sized beer barrels, lashed together in pairs and overlaid with an ordinary superstructure of barks and chasses. Early in January, in the dusk of the evening, twelve sappers under Lieutenant Drake, R.E., left the Inkermann camp with the small float, carried shoulder high by four men at a spell. Though the moon had risen, it was heavily beclouded, and the party was covered from Russian observation by the hills which, on either side of the winding road, rose sometimes sloping, sometimes abruptly, to their summits. The stream was nearly two miles away, and the carriage of the raft, over a broken country, where every step was fraught with danger and the supports distant, was no light enterprise. At length the

bank was reached. It was then dark ; but an occasional gleam of the moon, lit up the men and threw a pale streak across the water, which though it assisted to add a pleasing feature to the picture, was altogether unsuited to the secrecy of the service. Another long black cloud now spread itself over the meek orb, and no sooner was the little raft launched, than Lieutenant Drake, followed by corporal Ramsay, leaped upon it, and booming out took the required soundings and measured the breadth of the river. This done Lieutenant Drake landed on the opposite side and went forward to reconnoitre. Not long had he been away when one of the leaky barrels, becoming filled with water, drew the head of the float under the stream. Feeling that in all probability the whole raft would sink, Ramsay called lustily for Lieutenant Drake to return. If he came instantly there was a chance of recrossing in safety. Ramsay's voice was powerful ; and ringing among the hills and over the quiet stream, it was loud enough to collect a swarm of Russians at the spot, but none fortunately were seen. Lieutenant Drake, hearing the summons, quickly reappeared, and bounding from the bank to the sinking raft it capsized, pitching both into the river among the piles of the old bridge. It was excessively cold, snow was on the ground, and the water—though not iced over—was freezing. The officer swam ashore, but Ramsay, entangled among the guys of the raft could not strike out. On gaining the bank Lieutenant Drake asked whether his partner in adversity wanted help, and was about to re-enter the river to afford it, when the party hauled on the ropes, and Ramsay holding on with a benumbed grip to the raft, was pulled to land. Theirs was a miserable march to camp, but cold and frozen as they were, their unfailing spirits sustained them, and the corporal was more than compensated for his mishap by the reception he met with from a subaltern of the corps, who throwing aside the conventionalities which separate the soldier from the officer, gave him a place in his tent and entertained him hospitably. Three months after, this non-commissioned officer was killed at the Inkermann light-house battery.

A few nights later, the seventh company quitted the heights

under an assistant engineer—Mr. Newsome, who afterwards got a commission in the corps—to collect timber to be used for magazines and platforms in the mortar battery at Inkermann. Reaching the village unperceived, several of the men ascended the housetops, and throwing down the tiles, dislodged the beams and sheeting, whilst others ript up the floors and removed everything capable of serving the wants of an insatiable siege. Bearing loads far greater than under ordinary circumstances would have been allotted for carriage, the sappers turned their backs upon that desolate homestead ; and, as if driven into the earth, bent under the pressure of their burdens. It was a severe night, and the nipping air so braced up the men that their power to bear was redoubled, but their progress with such weights was necessarily slow. Soon they reached a steep hill up which they clambered with a lagging tread and hard breath, retaining with difficulty their footing, for the slope was slippery. Nevertheless they gradually pushed up, till a heavy shot made them drop their loads, to seek, by prostration, a possible escape. Every one was down in an instant, and the hissing projectile plunged into the hill side two or three feet above the head of private A. Grant. Another such a shot was aimed at them before they reached the summit of the hill, but it soared far too high to do any injury. Quickened by the danger of their situation, and thus feeling less the heaviness of their burdens, the party jogged on at a greatly accelerated pace, and reached the camp unharmed. This was the only instance, it is said, of the Russians firing at night while the Inkermann works were in progress, and was no doubt due to the noise occasioned by the rattling of tiles and timbers in devastating the village.

For some period in the new year, the weather continued so inclement that very little progress was made in the works. On several occasions the line parties could not be employed, for necessity more than commiseration returned them freezing to their tents. Directed by their officers, the sappers, only, held their posts and laboured as best they could against the stinging storms and winds which swept over the frosted hills. Many were frostbitten, several acutely ; a few lost their limbs, and

one man fell never to rise more. Yet amid all this severity they blasted the rock in many places to obtain cover, made loop-holes, erected gabion revetment, and where the drift had piled the snow in the more important excavations, removed it with almost impossible energy.⁴

On the 16th January, there were furnished for the right attack a minimum party of twenty-eight linesmen and two brigades of sappers under Captain Craigie and Lieutenant De Vere of the engineers. Bitter weeks of hard weather had already been experienced, but it required no uncommon spirit and fortitude to bear up against the trials of this day. By employing only a few men and constantly relieving them, it was hoped that the batteries might be kept clear. The men could scarcely feel their tools; their clothes in a few minutes became frozen; and a mass of ice covering those hirsute arrangements to which the dire necessities of war had given rise, all that could be seen of the countenance was a couple of patches of cadaverous skin drawn tightly over protruding bones. With the line the attempt to make way against the

⁴ During a night of searching cold, some sappers made a blaze with a few bits of broken gabions and fascines in the tool store in rear of No. 2 battery. It had nearly burnt out when private Corrigan going in for a warm, chided the men for not keeping up a better fire. "I know where some good charcoal can be found," said he, and off he went to collect it, bringing in with him, soon after, a number of *unc* little balls, firmly compacted and crisped with the frost. "Now for it," said the firemaster, impressed with the importance of his success, and speaking contemptuously of the discrimination of his comrades, "we shall soon have a fire worth looking at." With the confidence of one proud of his discovery he stirred up the sticks, and throwing a few pieces of the compound on the expiring embers, they soon ignited, and to the unutterable amazement of the group, exploded! Corrigan had perhaps the greatest reason to be astonished at the treacherous behaviour of his "patent fuel," for besides having the hair of his head, moustache, and beard burnt to the roots, his face was so scorched and scarified, it took three weeks to cure him of an injury which the Doctors had latinized into "Ambustio." The ingredient with which Corrigan hoped to make a roaring bivouac fire, consisted of some damaged powder which, removed from the magazine of No. 2 battery, had been thrown loosely over the ground, and, in mingling with the mud, had in time solidified into lumps wearing those pleasing characteristics which, in intense cold weather, was so apt to deceive a poor shivering soul. Ever after, whatever expedient the sappers employed to light their trench fires, they took care not to be beguiled into the use of "Corrigan's charcoal."

elements was given up; but the sappers stood boldly to their work though the drift fell in quite as fast as they shovelled it out, and the snow in heavy flakes beat against them. At length, however, they abandoned, not before they were ordered, a task in which no amount of human exertion could succeed. Hobbled home benumbed in every limb with curdled blood and almost lifeless hearts, they appeared at the tents covered from head to heel in a panoply of ice. What misery followed their return few can imagine. From their great coats they shook the snow in cakes, and tore it from their beards and moustaches; then throwing themselves on their wretched pallets undressed and unbooted, sought repose in a rest that was as cold as comfortless.

Equal suffering was felt on the same day by 56 sappers and 104 men of the infantry dispersed in the trenches on the Inkermann ridge. The latter attended in chief to the removal of the snow, which heaped up in pyramids to the crests of the works, choked every angle of the batteries. The former tore down the walls of a damaged magazine, revetted embrasures, and heightened the parapets. In these services their exertions were much impeded by the storm, and when withdrawn, after six hours' exposure and labour, they waded to the camp like so many icebergs.

The night of the 25th opened very mildly. Lieutenant De Vere was the officer of engineers on duty on the right attack. He had under him a sergeant and four sappers who superintended forty-eight Turks, as also forty men of the line during the first relief, and thirty the second. The former relief worked five hours; the latter four; the sappers and Turks were on duty the whole period. Sturdy attempts were made to improve some of the slopes in the second parallel, but with a return altogether incommensurate with the labour bestowed, for the frost had so firm a hold of the ground that the pickaxes flew from it as from a rock. Beyond bringing up some hurters for platforms and clearing the drains in the 21-gun battery and boyau leading to the work in advance, very little was effected. By degrees the night fell peculiarly dark,

increasing in blackness, till, at one time, it was suffocatingly dense. A man could scarcely discern his uplifted hand. While this phenomenon brooded over the trenches, the cold was intense; it nipt deeply, and the feeling was quite as painful as if the skin were peeling from the face. Work was out of the question. It was as much as the men could do to save themselves from frostbite and numbness, by chafing the face and hands and briskly exercising the lower limbs. In this way the party continued until relieved at four o'clock in the morning, at which hour all were fatigued and worn by their exertions to keep the vital stream within them from curdling.

Up to the 3rd February, the staple work in the trenches was the removal of snow, and then followed an interval during which the men were mid-leg in mud. To remove this obstruction the draining was improved and otherwise facilitated by making additional openings in the parapets to carry off the water and convey it by natural channels down the slopes of the hills into the ravines. These impediments, though they greatly interfered with the general progress, did not slacken the exertions of the sappers, who were everywhere seen building magazines, making traverses, blasting rock, and fulfilling the multifarious details essential to constitute the batteries and their field appurtenances, efficient and complete. So far it was found impracticable to do more than keep the current constructions in tolerable repair. To advance was out of the question. Some French officers of engineers who had observed, from the beginning, the firm and laborious activity of the sappers, spoke of them with admiration. "*Des braves soldats, et des bon sapeurs et travailleurs,*" was their constant commendation.⁵

The first company, 101 strong, under the command of Captain J. M. F. Browne of the engineers, landed at Balaklava on the 7th, where it was retained for engineer services, chiefly in the removal and erection of the huts which had already arrived in great numbers. Its employment at that

⁵ Letter from Sir John Burgoyne, dated 5th February, 1855.

port was considered sufficient for its wants, and the detachments hitherto cantoned there were recalled to their companies at the siege. Such however was the demand for sappers in front, that the company itself was soon moved to the camp for trench duty.

Corporal James Hawes and private William Pettit had been sent to Lord Lucan's division to build stabling for the horses. It was intended that Lieut. Lennox should superintend the service, but such was the pressure in front for engineer officers he was removed the next day, and Major Hall of the Bengal engineers, was made responsible for its execution. The sappers commenced work on the 9th December, 1854, and finished on the 11th February following.⁶ Daily the corporal had under him eighteen troopers—carpenters, masons, and bricklayers, and a force of Turks, for a fortnight, sometimes as many as 200, digging foundations and bringing up stones from an old wall which enclosed a large building—a well-to-do farm-house and grounds—known as Lord Lucan's dépôt. Anxious for its speedy erection Lord Lucan was constantly moving among the workmen, and encouraging the corporal in his exertions and supervision. Wood for a time was with difficulty procured, but when ready, it was brought from Balaklava by the ablest of the cavalry horses, the timbers and planks being slung on both sides of their saddles with the ends trailing through the mud and snow. The first stable constructed was that for the dépôt near Kadikoi. It was completed about the 20th December; the stabling then swept in a curve round the slope of the hill, the foot of which run into the basin where the famous battle of Balaklava was fought, and terminated at the road leading towards the Sebastopol camp. The length of stabling and the number of horses hutted when the work was finished were as follows:—

⁶ The Commissioners, sent to the Crimea to inquire into certain matters of mismanagement, in their Second Report, dated January, 1856, stated, that "the date at which the hutting commenced was in no case earlier than the end of January or beginning of February, and it was not completed before the end of March." This information, obtained from evidences, who no doubt spoke from recollection, is certainly incorrect.

	Length of Stabling occupied by each Regiment. Feet.	Number of Horses accommodated.
Lord Lucan's depôt	430	106
6th Inniskillings	330	92
2nd Greys	455	130
5th Dragoon Guards	270	78
1st Royal Dragoons	390	108
11th Hussars	90	26
4th Light Dragoons	120	28
13th Light Dragoons	153	34
8th Hussars	129	26
4th Dragoon Guards	488	122
	2855	750

This quantity of stabling was about 150 yards less than half-a-mile long. The regiments were brigaded in the above order; the depôt being on the right; the 4th Dragoon Guards on the left. The stabling was not turned out of hand in this consecutive manner; but after the depôt for the sick horses was finished, the butting for the cavalry was commenced simultaneously for each regiment in proportion to the number of artificers each could furnish. As the work progressed—not waiting for the actual completion of each hut—horses were daily added to the general number accommodated, protected at night by loosely boarding up the open ends to screen the animals from the frost and snow drift. In this way sometimes eleven, sometimes twelve horses were every day picketed under cover. Considering the small force of mechanics employed, the extreme cold of the season, and the dread frost which pinched the men as they laboured, the construction of the stabling was really a masterpiece of rapidity; and Lord Lucan who had just then been recalled, was so well satisfied of the thorough zeal and exertions of corporal Hawes, that one of his Lordship's last acts before leaving the Crimea, was to send for him on shipboard, and present him, in writing, a testimonial which spoke of the corporal's qualities and his Lordship's admiration of them.

On the 13th February, an 8-gun battery, No. 9, was commenced in rear of the right advanced parallel. This was occasioned by the intended occupation of the Mamelon as an

emplacement for a battery to be used by the French against the Malakoff. Scarce in linesmen, and Turkish co-operation having dwindled to a few files, the allies undertook to rear the work. Guided by the sappers to the site, 200 Zouaves broke ground, and the cover obtained by them in the night was excellent. Their recklessness of toil displayed a strong contrast to the conduct of the English working party who, disregarding the orders of the officer in charge, did little, on relieving the French, to add to the extension of the works. The duty of the latter simply included the carrying of gabions, which, "chiefly by the exertions of the sappers," were lodged in front of the battery as a temporary screen to the men shovelling in front of the parapet. Without this screen the workmen could not have stood their ground in the day-time.

Next morning, lance-corporal William J. Lendrim was selected as the sapper superintendent of the battery by Lieutenant Anderson, R.E., who directed the service. One hundred and fifty chasseurs were told off to it. A vigorous firing on the work for more than an hour knocked over several of the gabions, and to fill up the breaches was a species of forlorn hope, as two of the Frenchmen were killed and four others wounded in the trench. Corporal Lendrim, an intrepid and skilful man, accustomed to lead, zealously pushed on from gap to gap, and by his exertions every gabion was firmly replaced. The French officer in charge of the chasseurs witnessed with admiration the corporal's "coolness and good example," and applauded them to the British engineer.

There were other obstacles to contend with in the construction of this battery from the presence of rock, the stubbornness of which required the aid of sappers to blast it; and on the 15th it is recorded, "that considering the darkness of the night, they worked very satisfactorily in mining." On the 19th the initial part of the battery being completed, the French were withdrawn, taking with them an enviable character for their well-directed efforts and good behaviour. For the sappers were reserved the dress and finish of the battery, the formation of the embrasures, the construction of the magazines, and the

general drainage; and as time wore on, when fitted up with its armament, it played an active part in the subsequent siege.

Already the right attack had finished its second line of trenches. The approaches and cuttings between the parallels, bore, in their *ensemble*, the appearance of a leaning tower with a battlemented crown. The left attack broke ground, on the 14th of February, for its third parallel. Approached by regular zigzags, the works exhibited none of that intricacy which, on the right was unavoidable, from the ever changing enfilade of the enemy's constructions.

When it was decided the army was to winter in the Crimea, no delay occurred in obtaining wood for housing the troops. Bell tents were considered unsuited to a region subject to heavy storms of rain and snow and high freezing winds. Accordingly on the 9th November, 1854, Lieutenant De Vere and four sappers were sent to Sinope to procure boards and scantling for huts. Timber grew in abundance along the shores of the Black Sea, and quantities of it were shipped for Balaklava. As the troops were absorbed in trench and other duties, and hired labour could not be had, there existed insuperable difficulties to constructing the huts. When this was known at home the Government entered into contracts to provide a large number of wooden buildings cut into planks and complete in fitments, which, with printed instructions and a few sappers conversant with the mode of putting them together, might readily be erected by unskilled workmen. Thirteen sapper carpenters were selected for the service, who, for a time, were stationed at Portsmouth and Southampton; and after making themselves acquainted with all the details of the structures, embarked singly or in twos, in some of the vessels which conveyed the prepared timbers to the Crimea. The first parties left about the 5th December, 1854; the last arrived at Balaklava on the 22nd February following; and those men were distributed through the camp to aid the building of the huts, which, from the utter failure of the means of transport and the want of strength in the men to bear them to the front, progressed at so

tardy a rate, that the spring was far advanced before the whole of the troops were huttet.⁷

On the 27th February, the sappers had laid some platforms, opened embrasures, and drained a portion of the magazine in the 8-gun battery on the right attack, when some accurate firing into it, killed one man and wounded six others, two of whom were sappers. These were privates David Cuthbert severely in the right arm by the explosion of a shell, and Thomas Gilchrist slightly in the left hand by a rifle bullet. The majority of the line quitted and several hours' progress in the work were lost in consequence. The sapper brigades in no degree deterred by the casualties, continued, with their usual good luck, to exert themselves at the revetments without further accident.

Many portions of the right being enfiladed by the enemy's riflemen posted on the spur leading to the Mamelon, a new trace was adopted to counterbalance its effects. It was begun on the night of the 27th, and before the morning seventy yards of ground were opened, and a dead mound of earth more than four feet high faced the enemy. With the same object parapets were heightened and those in advance thickened, whilst a zigzag leading to the advanced parallel was changed in its direction. In this zigzag, to suit the changed character of the trench, the parapet close to the *well*—for there were wells in the excavations—was pulled down and a drain built through it. Stones also were placed at easy distances, as in an Irish bog or shallow

⁷ A party of French sappers arrived at Southampton early in December, 1854, to superintend the embarkation of huts for the Imperial army in the Crimea. From the moment of their landing they were shown every respect by the British sappers in that city, and, moreover, provided by them with a generous entertainment at the Floating House Tavern. The meeting was one of unmixed friendship, as if there never had been, between the nations, any differences or dissimilar sympathies to mar its cordiality. Two corps of neighbouring nations, bearing corresponding names, socially joined at the same feast, is perhaps a unique incident. The guests were represented by Mons. Von Doyson and sergeant Tagnier, whose speeches, with those of sergeant-major Steel, quartermaster-sergeant Simpson, and colour-sergeant Spencer, were warm and fraternal. The toasts were such as might have been expected in so loyal a gathering. After shipping no less than 1,350 huts to accommodate 45,000 men, the French sappers sailed for Sebastopol in January, 1855.

stream, to enable the men going for water to keep their feet dry and prevent the destruction of the sewer.

In the night of the 2nd March the sapper brigades made a road for the passage of ordnance into the eight-gun battery, and two were brought in and mounted by the artillery. At day-break the opening was blinded with gabions and fascines, and continued so masked till the time for passing the remaining armament into the battery. Next night, with a line party, they commenced in front of the third parallel on the left attack an elevated sand-bag battery, technically termed No. 7, for six guns. Captain Hassard directed the work. The approach to it was by flying sap. About 10,000 sand-bags were laid during the darkness on open ground without shelter. The cover exceeded five feet, and its thickness at bottom six feet. Earth was thrown among the layers of bags by a strong force of shovellers from the outside. The soil was of a clayey nature, and made the work compact. Three traverses were built and two magazines well advanced. The embrasures, formed as the work proceeded, were blinded just before the relief, so that at daylight the battery seemed like a common mound only. It, however, told its tale to the enemy. The first relief gave 165 men of the line, but only 90 for the second. The number of sappers in the battery were about 120. The 17th, 57th, and Rifles worked very well, but the contingents from other regiments left with discredit. "The sappers worked admirably throughout the night without being relieved." One regiment in the following night, though remonstrated with by General Barnard, laboured very indifferently. By the 7th the parapet of the battery had attained an average width of 16 feet, and the right epaulment had risen to an altitude which afforded excellent cover to the sappers constructing the magazines during the day.

Four days after was commenced No. 8 battery of the same attack for eight guns. The strength of the sappers employed at it varied each relief, but at one time there were 40 of the corps engaged in its construction. It was traced by Major Bent and Lieutenant Graham on a shoulder of the right of the

third parallel. Lance-corporal George H. Collins, a very apt sapper, was very ready in measuring the distances, and afterwards in distributing and superintending the working party. When finished, the battery was an excellent field structure, and seemed furnished up like a model for the inspection of the curious. Its slopes, levels, and angles were true, its magazines well built and strong, and the *genouillères* were revetted in a way to admit the guns being run well up the embrasures, the checks of which were protected by hide bags. This, as well as No. 7 battery, were completed by the mutual co-operation of the line and sappers, the latter taking those portions which demanded art and dexterity. The rolling of heavy ordnance into these batteries on ponderous carriages, down narrow trenches deep in mud and mended with fascines and stones, was a very difficult operation. Now and then the ropes broke, and the strong iron hooks which connected them to the wheels of the carriage, yielding their tension to the strain, became straightened like bars, and jerked from the eyes in which they were locked. To make sure of the cut through which to pass *the gun and its carriage in the dark was a masterpiece of dexterity*; and in one instance a 68-pounder was pulled so wide of the mark that the sappers were obliged to enlarge the gap in the parapet. This was a far easier expedient than backing the gun to make another run for the opening. It took about eighty artillerymen, and no end of assistants, to man the drag-ropes and pass the great siege gun in question to its platform in No. 7 battery.

Meanwhile the brigades on the right attack were no less zealously occupied in furthering the general works. Among a wearying number of incidental services, they made magazines, platforms, and sand-bag traverses. They also formed rifle-pits on a knoll 130 yards in advance of the right mortar-battery, *where, the ground being rocky, protection for the light troops* was procured by stones and sand-bags built on the crest of the pit. On the night of the tenth the sappers toiled for ten hours unrelieved, and quitted the works with the commendation of their officers for having worked "remarkably well."

Next day the trenches were visited by Major-General Jones in company with Generals Niel and Bizot of the French engineers. It was then determined to open a new approach on the right of the advanced mortar-battery in the third parallel to run into the middle ravine, and there connect with the French parallel from the Inkermann attack. In the following night the work was commenced with a force of 28 superintending sappers, some of whom were early dismissed from day duty to keep their energies intact for the new work. The line furnished two reliefs of 285 and 211 men, for each of which the duration of work was about five and a half hours, but for the sappers eleven. As if by the touch of a magician's wand, though the night was excessively dark, 444 gabions were lodged along the outstretched arm of the parallel. The sappers led the way, leaving the line to seek the cover; and in this also the former afforded active assistance when they had completed the deposition of the gabions. In some parts the cover was very inadequate, owing to the rocky nature of the ground, and the work was somewhat interrupted by an alarm which drove the working parties to their arms. With all this obstruction the progress was surprising, and corporal Alexander Ramsay of the corps—a man of cultivated ideas and daring demeanour—was particularly useful during the night in leading and instructing the men. Two other corporals—William Wilson and Kester Knight—displayed so much “zeal and capacity” in the operations that, noticed by Lieutenant-Colonel Tylden, they were promoted to be sergeants, and a like advancement would have been conferred on corporal Ramsay, but he early fell an example of bravery and devotion.

Before commencing the work, Majors Gordon and Tylden went out to trace it, taking with them lance-corporal Evans^a and private William Harvey, as also a man of the 34th as a sentry. Having gone as far as they intended, the Majors went away alone to reconnoitre, leaving the men lying on the alert at the end of the tape. In a few minutes the officers returned, and all

^a Killed at the assault of the Rifle-pits 19th April.

went forward some distance to a semi-circular rifle-screen built of loose stones about six feet high. This was to be destroyed with all possible haste and the utmost quietness. Pushing into the screen, the sappers disintegrated the stones and handed them to the officers outside, who laid them gently on the ground. Not one was permitted to drop. So went on the demolition till about three feet of the wall had been taken down, when, some Russians having crept up to occupy the screen, and finding from the grating of the stones, which they could distinctly hear, that strangers were present, fired a volley and killed the sentry, who was shot in three places. At the instant, the unarmed sappers vaulted over the masonry, but Harvey having leaped against Major Tylden, both rolled into a stony hollow which had been broken by quarrying. Beyond a bruise or two they felt no inconvenience from the fall. Quickly regaining their feet, they bounded swiftly onwards with Major Gordon and the corporal, and returned to the trenches followed by a stream of fire which miraculously missed them. Of Harvey the official record runs thus:—"He has done good service on different occasions, particularly in assisting to trace works near the enemy's sentries."

In the succeeding night the ground was further opened for 200 yards, but a sortie obstructed the operation; and on the return of the Russians they coolly bore away with them, as trophies of their boldness, between forty and fifty unwieldy gabions to embody in their own defences. On the 13th the enemy's fire on the extended parallel was so annoying the linesmen were withdrawn, leaving two brigades of sappers to continue the work, but they, too, were eventually recalled to save them from unnecessary danger. Night after night the work on this long lean arm of the parallel was pushed forward, and as much accomplished in daylight as the Russian fire permitted. Much blasting was required to deepen and widen the trench, and on several occasions none but sappers could be allotted for the work. Once, when so disposed—the sappers being concealed behind a bend of the revetment—some Russian riflemen stole up in daylight to the head of the trench and rolled from

the trace several baskets, which they bore away as far as they were able. Nothing could have been more tantalizing than this audacious proceeding, but there was no help for it, as the sappers were unarmed. Gabions being scarce, cover was obtained by building strong stone rubble walls. With entire success and without material loss, though close to the enemy's riflemen and exposed to shot, shells, and grape, the Anglo-French parallels were connected on the 17th March.

A few days prior to the union of the international trenches, Captain Craigie of the Engineers was killed. He was returning with his sappers from the 21-gun battery, and had reached the middle ravine, when a shell from the Malakoff burst in the air, and a splinter striking him in the back he fell dead. He was preceded by his bugler—Armstrong—and followed by corporals Kester Knight and John Rowley. When the shell burst, the two non-commissioned officers, seeing the splinter coming, moved on either side, and it passed between their heads, fatally alighting on the Captain. His party carried his body to the camp, and he was mourned by the men as an officer whose kindness had been shown to them in a thousand inobtrusive ways. Just before he dropped he had been conversing with his non-commissioned officers on the best mode of avoiding an exploded shell, but a bursting missile defies all theory and experience, and makes the escape of life depend not on the adroitness of poor humanity, but the will of Providence. The fourth company, which the captain had commanded for several years, and over whose interests he had watched as a friend and father, erected a small monumental cross to his memory at the spot where his remains were interred.*

Private Henry Masters was wounded on the 14th.

Sir John Burgoyne, who held a consultative appointment, and shared in degree with Lord Raglan the responsibility of the siege, was, though an aged General, ever present to direct

* The cross bore this simple epitaph:—"To the memory of a Captain, a Comrade, and a Friend; Captain A. D. Craigie, Royal Engineers, killed by the bursting of a shell, March 13, 1855." Corporal Geo. H. Collins fashioned the cross and cut the inscription.

the various works, and on resigning his connection with the army, he issued the following parting address to the corps:—

*“Head-quarters before Sebastopol,
“21st March, 1855.*

“The Inspector-General of Fortifications cannot quit this army without expressing his strong testimony to the exemplary manner in which the officers of royal engineers, and non-commissioned officers and privates of royal sappers and miners have performed, under his own eye, their arduous duties before Sebastopol.

“The I. G. F. is not aware of any siege which has been carried on under more trying and difficult circumstances, and he has had great pleasure in repeatedly pointing out to the Commander-in-Chief how gallantly and creditably every operation by the engineer department has been conducted.

“In now taking leave of his comrades of all ranks he thinks he cannot wish them better fortune than that finally in this enterprise they may meet with success, that as far as depends upon them is so well earned.”

To this was added the following remark:—

“I entirely concur in the sentiments above expressed.

(Signed)

“RAGLAN.”

A sortie was made on the night of the 22nd March against Nos. 7 and 8 batteries of the left third parallel, in which Captain Montagu of the Engineers was taken prisoner. For half an hour the batteries were held by the Russians, whose impetuosity had given them a footing there. Driven out at length at the point of the bayonet, led by Captain Chapman, 20th regiment, assistant engineer, they took with them in their flight 70 pickaxes and 50 shovels. There were only eleven sappers in the trenches at the time, who, being unarmed and dispersed over the different works, were unprepared for the fight. A few of them, however, joined in the repulse with arms taken from the grasp of some slain linesmen, whilst others did their best in bludgeoning the Russians with pick-helves and sticks.

A like sortie rushed into the advance parallel and mortar-battery on the right attack, but was repulsed with loss. Three British officers were killed and two wounded. Of the latter one was Major Gordon of the Engineers, severely in the right arm. Of colossal height, he was observed on the top of the parapet with no better defence than a swish whipping the Russians from

the works. Under his orders there were five brigades of sappers scattered to various points of the chequered operations, who escaped that night without casualty.

After the sortie had failed, corporal Lendrim, led by the groans of a wounded man about thirty yards in front of the battery, clambered over the parapet, and followed by two linesmen, moved to the spot where the sufferer was lying. He was a Russian. No lack of bullets were flying at the time to warn the corporal and his comrades of the risk they incurred, but holding to the task they had humanely undertaken, they carried him to the parapet. Gently laying him down, they were about to renew their lift, when the last struggle seized the poor Russian, and in a few seconds he was no more.

Too weak to afford an adequate force for the emergencies of the siege, irrespective of the demands which had been fruitlessly made for its services in the rear, it was considered of moment to augment the corps. Accordingly, on the 22nd March, an authority was given for forming four new companies of 120 sergeants and rank and file each, by which the royal sappers and miners were swollen from a strength of 2,658 officers and men to one of 3,140 of all ranks. The new companies were designated the 23rd, 24th, 25th, and 26th. The first two were raised on the 1st April; the others were not embodied before September and October.

The 23rd company was constituted a driver troop for the conveyance of the royal engineer field equipment. Hitherto the engineers had to depend in great measure for the movement of its stores on the resources of other departments, which too frequently accorded insufficient assistance. To be at the mercy of any caprice or department was undesirable in a service whose success, in degree, depended upon the prompt transport of its materials; and the suggestions on this question, derived from the experience of the Peninsular engineers, meeting with the approbation of Lord Panmure, the troop was called into existence. Very readily was it formed, for the standard to recruit ostlers and others of that genus, was reduced so low that a lad of ordinary growth could easily command the admitted

altitude. In a few days the necessary number had been enlisted; but this troop of dwarfs, accustomed though they had been to horses and driving, required some time to throw them into shape and order, and this could only be done by discipline and imparting to them as much of the art of military equitation and manœuvring as was consistent with their organization and intended services. One hundred and twenty round-bodied cobs, purchased at an expense of 36*l.* each, formed the complement of horses for this novel troop. Captain Siborne was its commanding officer. A few months after its formation, Sir John Burgoyne inspected the corps at Woolwich, and he was more than surprised at the smartness of the company and the expertness with which the young troopers managed their horses. A sergeant from the royal artillery—William Handyside—was promoted into the company with the rank of Lieutenant and Adjutant, but before the appointment reached him, having obtained a commission in the Land Transport Corps, he declined the Adjutancy. It proved a wise resignation for him, as soon after, he was promoted in his own corps to the rank of Captain. Another sergeant—Henry Saville—from the artillery in the Crimea, was commissioned into the troop on the 22nd October, 1855, with the pay of 9*s.* 10*d.* a-day.

To supply the general increase, several new recruiting stations were opened, and the militias were canvassed for candidates. The old stations sent in batches with their usual steadiness, scarcely accelerated by the popularity of the war; but the new ones, opening with a sort of burst, detailing the advantages of enlistment on gorgeous bills, offering high bounties, and lecturing the applicants with that hyperbolic eloquence which, though unfair, is tolerated as a necessary evil in military life, were very successful. Strong instalments of militia-men constantly arrived, but recruited as many of them were by line officers appointed to canvas particular districts, who knew nothing of the qualifications required of the candidates, not a few were useless for the general duties of the corps. But those were not times to stand opposed to the reception of men who, though they lacked the antecedents so uniformly exacted from recruits by officers of

the royal engineers, might yet be made to perform serviceable duties in the trenches. In this way a vast number of militia-men—too many of them undersized, unseemly, and professionally incapable, of an entirely different stamp in character and impress to the genuine craftsman and sapper—fell into the ranks of the corps, who in less pressing times would have been regarded as not worth the trouble of a negotiation. In the course of nine months from the date of the increase no less than 500 militia-men and about 800 other recruits joined the royal sappers and miners.

At night on the 27th, sergeant Docherty accompanied Lieutenant Penn, R.A., to a point in the ravine near the cemetery where some rifle pits were to be established. After acquainting himself with the locality, he was directed by the officer to return to the trenches and visit the workmen. The night was very dark, and danger was apprehended from some Russian screens near the garden wall. Docherty picked his way as best he could, without a track to guide him, over broken ground and by detached blocks of rock and precipitous cliffs, till he clambered up a beetling brow to the crest of the valley, where, lying down, he applied his ear to discover if any one was astir in his vicinity. There were footsteps not far from him—the measured pace of a sentinel, towards whom he cautiously moved; but as he went nearer, he saw, through the darkness, the shadowy outline of two men whom he suspected belonged to a Russian picket. Wishing, as he was still unobserved, to be assured of his position before proceeding further, he used the faint whistle which the English sentries knew how to acknowledge, and his signal was returned by a purling sound equally faint. No longer in doubt of his safety he advanced to the two men, one of whom was a sergeant; but as Docherty, approaching them from the front, was looked upon as a spy, he was marched to the field officer of the trenches. Speaking English, and making known his corps and rank, were only so many proofs to the sergeant that his prisoner was a clever Russian. The field officer examined him, and receiving accurate replies to his interrogatories on subjects which a sapper only could have become acquainted

with, dismissed him—to the surprise of the sergeant, who was thus deprived of the chance of recording, among the incidents of his trench life, the capture of a Russian spy.

Fears were expressed on the 29th March that the enemy was mining under one of the cave magazines on the right attack. A sapper acquainted with the methods of detecting subterranean noises volunteered to enter the cave to ascertain if any work was being carried on beneath it. In this hole, with enough gunpowder in it to excite alarm, he coolly immured himself for more than two hours; but hearing nothing to convince him of the existence of a countermine, quitted his concealment and allayed by his report the apprehension.

On the 31st March, private William Relf was severely wounded in the knee, and second-corporal Richard Bridgman was hit slightly in the face and shoulder. Both were struck by splinters from the same shell. For months this non-commissioned officer was daily and nightly in the trenches serving out the tools on the right attack, and on three or four occasions the helms of axes and shovels have been shattered in his hand while passing them to the workmen.

During the night of the 2nd April, a zig-zag was opened from the right rifle pit in front of the advanced parallel right attack by flying sap. One hundred and twenty yards were trenched, and the cover thrown up was very tolerable. The moon being bright, the "flying" nature of the operation was reduced to one of tardy but impulsive efforts. As the light, however, gave but a dim outline of the sap to the enemy, the Russian fire from two field-pieces was delivered indifferently; but when the morning began to break, greater accuracy was obtained, and a few men were struck down. Among them were privates Robert Russell killed, and Thomas McNeil severely wounded. The former had his head smashed by a round shot, and, singularly enough, a fragment of his quivering jaw flew off and wedged into the jaw of his comrade—McNeil—and broke it.

Early in the morning of the 4th April, Lieutenant Bainbrigge of the engineers was killed. He had given directions to corporal William Baker of the seventh company, relative to

strengthening the parapet of a battery to the left of No. 9, in the second parallel right attack, when a shell was observed coming towards them from the Redan. Both were on the open without the remotest chance of taking cover. To avoid the danger the corporal started to the right, the young subaltern to the left, as if to allow the missile to pass between them. At that instant it plunged at the feet of the officer, and bursting, blew his body to atoms. The corporal was untouched. There were, at the time, fifteen of a working party in a shallow trench, throwing earth from the front to the merlon of the battery, but not a man was struck.

Next night corporal J. J. Stanton, with four sappers, was entrusted with the extension of the third parallel, right attack. He was a daring man was the corporal, and flying on with the work, he laid himself no less than 170 gabions. His four overseers filled them with bags of sand, handed forward by a working party of 200 men, who also broke the ground and improved the cover, despite an annoying fire from the rifle-pits about fifty yards in front. The soil fortunately was easy, and the men worked so well that, when the morning relief arrived, the parapet had risen to a height sufficient for a working party to improve the trench by day. The corporal was named in brigade orders for his spirited example and successful superintendence.

Increased exertions were turning to deadly account all the means necessary for giving magnitude and certainty to the operations. Everywhere the works were rising in different forms, menacing in aspect, which, only for the wide area of stony clay and rock which covered the hills, would, by this time, have almost intermingled with the advanced positions of the Russians. Impenetrable by pickaxe, mining was the common process of dislodging the stones. At particularly hard or exposed works it was impossible to employ any but sappers. The 21-gun battery, insatiable in its wants, commanded the zeal of strong parties. Rifle screens were begun, deepened, or improved far away in advance to pioneer the enterprise. That system of hostile espionage had been so successful, it was enlarged to lessen the fire of the enemy's tirailleurs. An advanced

excavation had been formed across the Woronzoff road in the middle ravine; but this not affording sufficient security against a surreptitious sortie, was further defended by a stout chevaux-de-frise fixed some distance in its front. Splinter-proof surgeries were also constructed, intimating an impending struggle. Limestone caverns in the sides of the hills were converted into receptacles for ammunition, shells, &c., and their rude entrances were protected by walls of sand bags and dry stones. Other magazines were also made by driving galleries under the superincumbent rock into a bed of clay resting on a vein of shells. Scooping out the earth between, artificial caves were thus formed with rocky roofs and testaceous floors. To provide against the chances of the arches falling in, by the concussion of heavy mortars in the batteries, strong props were fixed in those grottoes, and the powder deposited within them was preserved by the usual contrivances. All the revetments were put into fighting trim, and embrasures cut or masked as events dictated. The merlons, too, were thickened, so also were the traverses and parapets, more particularly in the parts where the works standing on the crests of the hills in advance were the most exposed. On the right attack, the sappers were driving on vigorously in advance of the second parallel. The first night's work for this object was given on the 3rd April. In a short time the zig-zag was run out to the intended point, and turning off like a shepherd's crook, it seemed as if it were ambitious to hook on to the Redan.

Three days later, seventy men were employed on the left attack, forming, on the right extremity of the third parallel, a work for two 9-pounders. Four hours they had laboured at it, when daylight having exposed them, the field officer refused to permit the continuance of their services. As, however, it was important to push the work, Major Chapman, of the 20th regiment, the assistant engineer on duty, ordered ten sappers under lance-corporal Robert Hanson, to repair to the trench. It was a clear morning and the work exciting. Gabions and fascines had been laid by a previous party, so that the sappers were covered from musketry, though not from heavier missiles. As

they were strengthening the parapet, the earth thrown up being seen by the enemy, a fire of every description of projectile, even links of chain, was hurled against it. In some measure to prevent accident, a "look-out man," in turn, took his station at the head of the trench to peep round the hot corner. Sweeping with a quick eye the cordon of ordnance in front, the caution to "look out" came thick and fast. In time it was so rapidly reiterated, occasioning interruptions which did not coincide with the men's notions of progress, that, preferring to toil without this species of questionable assistance, the "look out man" was withdrawn, and made to unite his strength with the shovellers. With faultless energy and confidence, they persevered in the work though harassed by an incessant fire, with grape in clusters, blown from mortars, dropping into the trench. Presently a shot crashed against the revetment, cap-sized three gabions and two fascines, wounded lance corporal James Veal in the neck, and knocking down corporal Hanson, buried him beneath the rubbish. There was great reason to fear that the smash was fatal, and Major Chapman, who happened to be in the work at the moment, called out in the forlorn hope of receiving a reply, "Are you hurt, corporal?" Unexpectedly there was a movement in the mass: the gabions rolled lazily aside as the corporal struggled from the debris; and in springing to his feet he cheerfully exclaimed, "All right, sir!" The perils of the battery were of a nature to induce Major Chapman instantly to withdraw the sappers. Two nights after, the work was finished and its embrasures were opened.

On the day of the 7th, lance-corporals Rinby and Jenkins were building a magazine in No. 8 battery of the left attack. The timbers were just rising when, seeing a 13-inch shell approaching from the Flagstaff, the latter dashed between the uprights and screened himself behind a traverse. Rinby, less fortunate, had to endure all the horrors of anticipated annihilation, for the shell, plunging towards him, passed with the swiftness of a meteor an inch or two from his back, and in bursting carried away the frame, without touching the carpenter.

During the next night the mouths of No. 7 battery, on the

left attack, were cut by a strong party of sappers, but the deep mud in the excavations did not admit of the guns being moved into position, so that in the interim the openings were blinded with sand-bag screens.

Extra exertions were made in every work for an impending bombardment. All the sappers available for duty, including those even who had been relieved from the front at six o'clock in the morning, were dispersed through the batteries, mending the soaked embrasures and parapets.

The weather had been tempestuous, and the rain, which fell as in a storm, flooded the trenches. The winds were howling and driving, and the cold very great. To work under such disadvantages was exceedingly hard. "Man or beast," says 'The Times,'¹⁰ "could not remain without some shelter. Not a man is now out, except the shivering camp sentinels and the men employed in the batteries."

¹⁰ April 24, 1855.

1855.

9th to 19th April.

SIEGE OF SEBASTOPOL.

Second bombardment—Gallant exertions of individual sappers—Repairing a magazine—Assistance to a comrade in an embrasure—Fatal meeting of schoolfellows—Cheerfulness in suffering—Slippery platforms—Repairing telegraph wire—Resistance of the magazines—Inkermann lighthouse battery—Progress of the siege—Mud in the trenches—Battery for two light field-pieces—Magazine on fire—Burning sand-bag on a merlon—Fixing mantlets—Unshrinking labours of sappers—Damages and repairs—Progress of the siege and works—Gallantry of two sappers—and two linesmen—Noble perseverance in an embrasure—Exertions at the batteries—Explosion of a magazine—No. 9 battery, left attack—Gallant extension of left advance sap, right attack—Devotion and firmness of the last leading sapper in it—Progress of the works—Capture of the rifle-pits—Gallantry of sergeant McDonald—Casualties—Devotion of corporal Coles—Acknowledgment of services of sappers in the attack.

As most of the works were ready it was considered advisable not to delay the second bombardment, which, on the morning of the 9th April, commenced on our side from 101 guns and mortars. Nearly all our batteries were in full play, whilst the Russians, opening by degrees a powerful array of ordnance from their extensive defences, checked the otherwise irresistible vigour of our well-served armaments. On the left attack, after blocking up a gap made for the passage of artillery, the workmen were withdrawn to the first parallel to place them out of immediate danger, leaving thirteen sappers with Captain Belson to attend to the urgent details of the fighting batteries. On the right attack there were 28 men of the corps dressed like their comrades on the left, in waterproofs and long boots.

During the cannonading, 90 soldiers of the line fed the sappers with sand-bags for the 21-gun battery, and assisted them in covering the roof of a magazine in 12-mortar battery. Other sappers worked in No. 10 battery in providing channels for clearing away the mud which obstructed the artillerymen at the guns. The damage done by the enemy's fire was comparatively trifling, and the breaches, in all vital cases, were promptly restored. Iron gabions made of the hoops of barrels and the bands of trusses of compressed hay, were, for the first time, opposed to discharges of heavy metal, and proved their excellence for defence. The Madras platform, still in use, only added to the cumulative facts of its inutility. The Russians fired about one shot to the besiegers' three; yet the result of this battering fell marvellously short of what was expected. "The sappers behaved remarkably well" this day, and second-corporal James Edward McKimm and private Neil McInnes, of the corps, were mentioned in brigade orders for their energy and ardour in repairing the works in exposed situations.

The corporal was in charge of eight sappers and a detachment of the line in the 21-gun battery, and, by his example, excited so strong an emulation among his men, that the repairs were executed with beautiful rapidity. Late in the day, when his parties—which had toiled for many hours with scarcely a minute's rest—began to show signs of exhaustion, his conduct was marked by an energy which seemingly rekindled with his straits. Moving from embrasure to embrasure, he worked upon the tired powers of the men by his own manly labours, aiding them, when, from lack of strength or spirit, they were unable to cope with the quickly-recurring damages. McInnes and John Harris, his most willing assistants, kept up to the last, but McInnes was the most distinguished sapper of the day. He had charge of the repairs of three embrasures; two of them did not require much attention, but the one numbered 17 was pressing in its wants. The firing upon it was very hot, and while McInnes occupied the opening, building its cheeks with sand-bags, six men were killed, and several wounded. Captain

Crofton witnessing his extreme exposure, desired him to suspend work, but the solid man with a calm smile declined, observing, "I want to make a good job of it." He was, however, not permitted to do this, for Lieutenant-Colonel Tylden soon after appeared, and ordered him from the embrasure. A private of the 47th helped McInnes as long as he needed sand-bags, bravely persisting in the duty, though he had been wounded in the head.

In the course of the day a shell entered a magazine in the vicinity of McInnes's work, which sheared away a portion of the roof. To wait for adventitious chances to apply his skill in such cases was not his maxim, and so walking up to the point of danger, commenced the repair, assisted by private Patrick Nelles and two or three men of the 47th regiment; and though another shell struck the roof, and threw the sand with violence in his face, he gave himself up to the work with so noble a pertinacity that Captain Peel of the navy, eulogized his exertions to Captain Crofton; and when the time arrived for showing the estimate made of his soldier-like bearing and activity, he was awarded a medal for distinguished service accompanied by a gratuity of five pounds.

"The country," wrote Lord Raglan, "was covered with water, and the ground was again very deep. The trenches were likewise extremely muddy, and their condition added greatly to the labours of the men employed in the batteries, chiefly of sailors, artillerymen, and sappers. They conducted their duties admirably."¹

In the 21-gun battery the revetment of an embrasure had tumbled down and covered the muzzle of a gun. Corporal McGinn at once jumped into the aperture to remove the debris. Seeing him unassisted sergeant Joseph Morant forced among the rubbish, and while the corporal laid the bags, the sergeant shovelled up the earth and packed it to give firmness to the structure. The day was very wet, and the earth which had fallen on the sole of the embrasure, had become so muddy and greasy, they found it difficult to prevent themselves slipping

¹ Dispatch, 10th April, 1855.

into the ditch. Trying and hazardous as was the duty, the orifice was restored before the adventurers quitted it.

In the same battery, Morant was speaking of by-gone times to two seamen, one of whom, named Soper, had been "a school and form fellow" of the sergeant. "This," said he to Morant, "is not such a cricket-match as we used to have at Portsmouth, and I'd advise you to look well to your stumps." Scarcely had he uttered the caution when a shot carried away his head, and scattered his brains over the breast of his old schoolfellow.

One sapper — private Thomas Muir — was dangerously wounded in the calf of the right leg, while mending the embrasure of the right 68-pounder gun in the 21-gun battery. As sergeant Morant was marching the party down the middle ravine, he jocosely remarked to Muir, that one or the other would be struck that day. Two hours after, Muir passed on a stretcher, and seeing Morant, he called out with unmistakeable cheerfulness, "You see, sergeant, I'm the first struck;" and onwards he was borne to the camp, singing all the way, as if for the entertainment of his bearers, some of those inspiring Scotch airs which connected his heart with home. Amputation was resorted to to save his life, but gradually sinking, he died on the 15th May.

Towards the close of the day the sappers busied themselves in draining the trenches, wretchedly deep in water and mud. Sawdust was scattered on the platforms to relieve them from slipperiness. Sliding about in every direction on the unctuous soil, the heavy mortars were unmanageable, and so to help the gunners in moving them, they were supplied with iron-shod handspikes from the engineer park. At night 58 sappers were thrown into the left attack, and about 28 into the right, and through the darkness and storm, though miserably wet and cold, completed all the essential restorations by the following morning. "The officers of engineers," writes Major-General Jones, "and sappers and miners continue active and zealous; the duty in this weather is very hard and severe upon them."

For some time the field electric telegraph had been in operation under Lieutenant Stopford. It was worked by several

sappers, sergeant Anderson being the chief executive non-commissioned officer. By the 8th April, lines of communication were open to the stations of divisions, to the trenches, and to head-quarters. That night the wire was laid to a cave near the first parallel on the right attack. It was no sooner completed than the sergeant received an order from Lieutenant Stopford to fix an instrument and battery in the cave, to obtain two orderlies from the covering party in the trenches, and apprise head-quarters as soon as the service was accomplished. This done, Anderson was directed to remain and work the instrument. Pleased with this the first appointment to the station—a dismally picturesque spot it was—he sent and received several messages. Among the latter was one to the general in command of the trenches, “to open fire from every gun at daylight.” The bombardment commenced at day-break, but in the midst of the din, at ten o’clock in the morning, an orderly, in breathless haste, delivered a note to the sergeant announcing the rather startling news that no communication could be sent to him from head-quarters, as it was supposed the wire was cut. He was, therefore, directed to examine and repair it. With some of the party, off he started, in a drenching rain, driving through sheets of water and swamp, and sinking at every step midleg in mud. He did not require to use the galvanometer to test the wire, for after bounding over the 21-gun battery, he soon found the spot where the current was interrupted. It was in the Woronzoff ravine, near the road, and in rear of the battery. A Russian 68-pounder had cut the line and laid about five feet of it bare. The duty was not devoid of danger. Shells burst around and shots flew by, but none of the manipulators were hurt. Removing the damaged wire, the sergeant replaced it with an approved piece, securing the connection by two joints; and after covering it with gutta-percha, relaid it in the furrow. It was a delicate operation to be performed under fire and required a cool head and a steady hand to effect it. On returning to the cave his situation was extremely disagreeable. Driven by a cutting wind, the rain beat into the chamber, and pattered

against the faces of the operators. At whatever cost, the sergeant was determined to maintain the instrument in working order, and, accordingly, without any consideration for his own comfort, took off his mackintosh, and with it hooded the instrument which was yet to carry out important correspondences. There was no rest in the cave; the mind was anxious, the eye on the stretch; and in that miserable hole, for more than thirty hours, the sergeant was at his post. When relieved, he again passed along the communication to mend it, if necessary; but in all parts it was efficient, although he found six shot holes and several cannon balls lying on the line. His two orderlies belonged to the 47th regiment, intelligent and willing men, who exerted themselves creditably in conveying the various messages to the trenches of both attacks.

Next day the bombardment was renewed. There were 36 sappers in the right works, and 30 in the left. The ordnance organized to play on the Russian works were about 94 pieces. Much injury was done to the magazines, embrasures, and parapets, chiefly by the heavy rains causing the sand-bag revetments to yield in several places. Though struck by several shot, the magazines on the whole stood well. One in the 21-gun battery bore up against the shock of a 13-inch shell. It was nevertheless much riven, but rapidly repaired. A 10-inch shell exploded on a magazine close to General Jones, simply disturbing a few sand-bags and the superincumbent earth.

The casualties were very few. Among them was Lieutenant Graves of the engineers, who received a contusion from stones thrown up by a shot striking a damaged embrasure, the repair of which by a sapper he was superintending. Private John Baston was also severely wounded and lance-corporal Peter Towell slightly. "The sappers behaved very well in repairing the embrasures, and even reconstructing them under fire;" and the coolness and soldier-like conduct in this service of privates George Harris, second company, and William Bruce of the seventh, were brought to the attention of Lord Raglan, and also communicated to the corps in general orders.

Early in the morning a corporal and five sappers were sent

to the Inkermann light-house battery on the extreme right of the French position, to open embrasures and fit the work to share in the bombardment. It was manned at the time by British artillerymen, and the sappers were despatched to the battery at the instance of the adjutant of the siege-train. Two embrasures only were cut through, when the eager gunners opened fire on the enemy. So weak an armament brought upon it a crushing cannonade, which effected considerable mischief before the Russian fire could be drawn off to other batteries. Corporal Ramsay—"a valuable man"²—"one of the best corporals at the right attack, and a most efficient sapper"³—was killed by a round shot, which made a trough in his chest and tore out his heart. Of this non-commissioned officer Lieutenant-Colonel Tylden thus wrote: "This morning corporal Ramsay was killed while at his duty in charge of a detachment opening embrasures of the battery opposite to the light-house at Inkermann; and such is the high character this non-commissioned officer bore, and such the very high opinion entertained of his merits and services since he joined the siege, that I am inclined to submit to the major-general commanding royal engineer, that some recognition of his merit be recorded in corps orders." Impressed with the justice of this suggestion, Lord Raglan gave directions that his name and deeds be recorded at Chatham. Private William Taylor was severely wounded in the right hand. Two casualties out of this weak brigade induced the artillery adjutant to relinquish the employment of the men by day in so fatal a spot. At night the work was completed by four sappers under the foremanship of corporal George Cann.

During the night of the 10th there were allotted to the engineers seventy-three sappers, who were so disposed that the repairs were executed with promptitude. The trenches were knee-deep in mud; the night was foggy, and the wind and rain, though heightening the miseries of the men, scarcely interrupted their exertions. Of the 9-pounder battery on the left attack, the

² 'Times,' April 26, 1855.

³ Captain, now Major Ewart, R.E., the sapper Adjutant in the Crimea.

revetments of one of its epaulments, penetrated by wet, subsidized and partially tumbled down. Efforts were made to restore it, but the morning broke before the desired solidity was attained. In every battery of the first parallel the embrasures were rebuilt and several magazines repaired and strengthened. Three embrasures were also reconstructed in the Picket House battery, and several gun and mortar platforms mended in different places. Among the numerous works on the right, the 21-gun battery and those bearing the numbers 8 and 11 claimed especial attention. When the working party had been removed at three o'clock in the morning three brigades of sappers were retained to finish the repairs. By daylight the embrasures, merlons, and parapets were all squared, even to their crests, and ready again for action.

Sixty-six fresh sappers were at work on the 11th. With the assistance of strong parties of the line all essential repairs were made to the batteries, traverses, &c. Sand-bags were filled in great numbers, and a magazine cave on the left of the second parallel of the Chapman attack was completed. The mud was cleared away in several places to the depth of eight inches. Pools standing in hollows or rocky localities were drained off and a flooded magazine was relieved of the storm water by baling. Difficulties like these added vastly to the fatigues of the workmen, and now and then, as a shell with its roaring fuze plunged near them, their only resource for safety was to dive into the turbid soil, from which, when the danger passed, they arose more picturesque than comfortable. The Major-General commanding made known in orders his appreciation of the good conduct of the companies in performing the laborious duties required of them in the siege.

Corporal William Hollis and private Joseph Finch were this day distinguished among their comrades for quickness and cleverness in the batteries, imperilled as were their lives by the enemy's fire. It occurred in this way. The parapet on the right of No. 8 battery in the third parallel of the left attack had been washed down by the storm for several yards. It was an object of great moment to restore it, with a view to protect

from enfilade a two-gun battery on its right. The ground was so muddy the two sappers were obliged to undermine the low parapet by drawing from it some dry earth and spreading it in the direction of their exertions to render their task less heavy. No sooner had they repaired the revetment with sand-bags and thickened the work as far as an elbow of the trench, than they were appointed to clear the embrasures of the new battery on the right for two light field-pieces to play on the quarries, which, harbouring a nest of expert marksmen, picked off our artillerymen at the guns. Wanted in a hurry, it was impossible to provide platforms in the time named, and a couple of boards for one gun having been laid to assist the recoil, in a few minutes a 9-pounder was run up to the aperture and fired on the quarries. At every discharge the boards sank deeper into the soil; now one, then the other was depressed so much that the gun heeled on either side and threw it out of the line of aim. Energetic attempts were made by the sappers to rectify the defect by forcing earth under the plank which happened to be lower; but the next discharge driving the boards still deeper in the mud and tilting the gun it was evidently useless to persevere in a service which demanded labour altogether disproportioned to its questionable advantages. Both embrasures were finished and supplied with temporary platforms in the night, and afterwards the battery swelled into a formidable structure—No. 14—armed with 32-pounders.

Larger contingents of men were sent to the attacks the following night, among whom were 90 sappers and miners. This was rather an effective party, and the weakened works were reproduced in as strong a condition as practicable. A new mortar-battery—No. 12 on the right—was also completed, and the great 21-gun work, with its ragged revetments, worn platforms, and disfigured magazines and traverses, was adjusted in a manner that, however dexterous were the men who wearied themselves in patching up its breaches, still bore the rugged features of its stern resistance.

The dawn of the 12th opened with the customary firing, but its results were far more serious than for the few days previous.

The enemy had ascertained the range of the 21-gun battery with so much exactness that every shot or shell, falling true at the work, tore up its embrasures and parapets. Two 13-inch shells, however, fell upon magazines without breaking through them. From splinters of shells the casualties were many. In the naval brigade alone about twelve men were killed and wounded. Captain Crofton of the Engineers was severely injured and died of his wounds. Private Alfred Jarratt was killed; both of his legs were carried away: and three privates were wounded. One—Donald McArthur—died a few days after the amputation of one of his legs, and James Bayne had his jaw fractured and his left cheek wounded.

A live shell having struck the roof of the magazine near the right 68-pounder gun in the 21-gun battery, some of the sand-bags took fire. Apprehending danger, Captain Peel of the navy begged some soldiers near him to quench it, who, indisposed to risk an enterprise so perilous, refused compliance. *Two sappers superintending the man-o'-war's men, though busy in repairing the embrasures, were then called on by the Captain to extinguish the burning bags.* Without hesitation, corporal James Wright and lance-corporal William J. Lendrim leaped on the roof, and, under fire from the enemy, quickly removed them, refilling the chasm with fresh sand-bags. Captain Peel himself assisted in the work. The delay of a few seconds might have seen the magazine in the air and the ground strewn with lifeless artillerymen. In descending, Captain Peel thanked the sappers for their exertions; but they had scarcely time to reflect on the service they had accomplished when a ball tearing through the battery covered them with earth. At this addendum to their labours the sailors chuckled with their accustomed mirth, and swore that was the fulsome way in which the Russians always bespattered the British with praise.

The same day Lendrim was about to enter an embrasure to remove a sand-bag which was burning on the sole, when the petty officer in charge of the gun mounted there requested him not to do so until he had fired, as the piece was already loaded. While waiting, a very young naval officer approached, and

asked Lendrim why he delayed the service. He soon explained, but the midshipman as quick as thought leaped into the opening and threw the bag on the merlon. Piqued at this interference, Lendrim told the officer he did not thank any one for doing a duty for which he was responsible; and added, "Since you have done so much you had better finish the job." With as much good sense as good nature, the officer, seeing the chafed spirit of the sapper, did not attempt to supplant him, and so Lendrim sprang into the embrasure. With some water brought to him by an assistant line soldier he quenched the smoking sand-bag and patched up the breach in the stricken check. Witnessing the corporal's coolness and celerity the officer observed, evidently to dissipate the unpleasant feeling which his daring had induced, "I would not have touched the bag had I known you were one of the old sappers." Lendrim was more than satisfied with this complimentary apology.

Sixteen extra sappers were sent to the left in the afternoon for exposed duty, and in two or three hours fixed mantlets across the gaping mouths of No. 7 battery. Under fire all the time the operation was necessarily hurried, and did not admit of those nice attentions which unopposed exertions would have permitted. The mantlets were simply suspended across the openings on a piece of wood jambed into the parapets of the embrasures. Four guns of the battery did good service against the Boulevard works. In the course of the evening two of the mantlets were blown away, but the battery stood up firmly.

In allusion to the officers and men under this date 'The Times' thus speaks of their unshrinking labours:—"It is impossible to deny to the Russian engineers great credit for the coolness with which they set about repairing damages under fire; but words cannot do more than justice to the exertions of our own men and to the engineer officers and sappers engaged in this most perilous duty. When an embrasure is struck and injured it is the business of the sappers to get into the vacant space and repair the damage, removing the gabions, &c., under fire, and without the least cover from shot, shell, or riflemen. Our engineer officers have frequently set the example to their

men in exposing themselves when not called upon to do so; and I believe that, as yet, there has not been a single instance in which a gun has been silent owing to damage done to an embrasure. The officers and men charged with this dangerous work have not waited for the cover of night to effect repairs, but have carried them on in the face of the enemy."⁴ This eulogium is corroborated by a conversation held between two officers of the engineers, in which one exclaimed to the other, "How admirably and cool these sappers behave under fire. They are really good men and brave soldiers."

As the night crept on 900 of the line and 89 sappers marched into the trenches, who, scattered among the batteries, left no point unstrengthened, no embrasure unequal to its wonted work. Everywhere the platforms obtained fixity, and the gaps which had been made in the parapets for the passage of cumbersome guns were filled up before the darkness sped. Much shattered was the Gordon battery, and its fascines, broken at the bands, were strewn in waste about the gorges, while the sand-bags were ripped up and disembowelled by every telling shot and tearing splinter. Iron gabions and fresh sand-bags were pressed into the embrasures to patch up their furrowed cheeks, and the shot-holes behind were plugged up with earth. A new sand-bag battery for four guns on the right attack was founded this night in rear of the left communication from the 8-gun battery to the left boyau. Much would have been done to raise it, but the night was dismally dark, and as rain was falling the men straggled on the road and loitered in their tasks. With fruitless effect the engineers and sappers tried to awaken in the workmen something like passable animation. Nevertheless 1,600 sand-bags reached the site and the sappers tossed and packed them in their places with nonchalant dexterity. Though much annoyed by fire from opposing rifle-screens, four men, superintending 100 of the infantry, made good progress in rendering defensible the advanced works on the left of the second parallel across the Woronzoff road, and six sappers in the 8-gun battery first relieved it of the debris

⁴ 'Times,' April 26, 1855.

which choked up the embrasures and then masked them. Early in the morning private Joseph McAsh was killed.

The fifth day's bombardment commenced on the 13th April, and No. 9 battery on the right attack opened for the first time on the Malakoff and Mamelon. Until ready to fire its embrasures were blinded with hide bags filled with hay, which effectually answered the intention of their employment. No. 7 battery on the left was silenced by overpowering discharges upon it from the Upper Garden batteries. It was, moreover, much broken and its salients knocked into grotesque forms. Ninety-four sappers were in the trenches eleven hours giving heed to the quickly-recurring urgencies of the siege. In the following night No. 7 battery was again in battle order, and No. 8, which had been delayed from untoward vicissitudes in weather, was also provided with its equipment of heavy guns. About this time the scaling-ladders at the parks were prepared and held in readiness with selected parties of sappers to take advantage of any event that might turn up by tactics or strategy to render an assault desirable.

In a despatch dated 14th April Lord Raglan remarked:—"Our parapets and batteries continue to stand remarkably well, notwithstanding the very unfavourable state of the weather. Although the duties have been unusually severe and arduous both by night and day during the week they have been carried out with the utmost cheerfulness and zeal, reflecting much credit both on officers and men." The necessity for these repairs and exertions were constant, and never more so than on the date of the despatch.

Captain Burnett of the navy, who narrowly watched the efforts made to execute the repairs in the 21-gun battery, was impressed with the steadiness and intelligent activity of privates Robert Crawford Cowan and William Baker, seventh company, while working at the embrasure for the Lancaster gun. It was mended with gabions, fascines, and sand-bags. Completing the restoration before quitting the opening, their gallant perseverance, despite the bursting of shells and the flight of Miniés, was recorded by Major-General Jones in brigade orders. In-

deed the cheeks were thrice patched up during the day by these intrepid men who also attended to the lesser damages in Nos. 15 and 16 embrasures. With No. 17 embrasure, these three constituted, in the homely phraseology of the sailors, "the slaughter-house." Lieutenant-Colonel Tylden also observed that he could mention other sappers who were zealous and unflinching under fire; "but," he proceeds, "I am glad to be able to report that the men generally do their duty so well that there are few who can be named as exceptions." Private William Smale was severely wounded this day in the right leg by the splinter of a shell while repairing a platform in the 21-gun battery.

It will not, perhaps, be misplaced to mention here the names of privates Samuel Evans and James Callaghan of the 19th regiment. Seeing a sapper—private Alexander McCaughey—toiling by himself in the difficult repair of a broken embrasure—No. 17 of the 21-gun battery—the former voluntarily went into the opening and shared with the overseer the duty of removing the debris. The latter received a blow on the head from a stone sufficient to draw blood, and certainly sufficient for ninety-nine men out of a hundred to get excused from a working party, but he nevertheless remained steadily at work.⁵ These instances of devotion were noticed in general orders and praised by Lord Raglan.

After the embrasure spoken of was cleared Evans quitted it; and private David Thompson, who had just finished the repair of a neighbouring one, came to the assistance of McCaughey. Both were robust men, immovable in danger, and nobly stood the fire of two guns from the Redan, the accurate aim of which sent several missiles into the work. Of one cheek they had replaced the gabions and partly filled them, when a 68-pounder shot swept four of them from the row, and shortly after another whizzed closely over Thompson's head as he was springing from the sole to avoid the threatened blow. In another instant

⁵ *Light Division orders by Lieut.-General Sir George Brown, dated 16th April, 1855, taken from Captain Owen's report to Major-General Jones two days earlier.*

both were at work again, but as the firing became still warmer, their labour was obviously as fruitless as that of Sisyphus. "You cannot do impossibilities, men," said Captain Owen, who witnessed their perseverance, and ordered them from the aperture, which, on leaving, they blinded with a gabion. The gun mounted in rear of the opening was a 68-pounder, and a black sailor, considered to be one of the best artillerists in the battery, usually fired it. McCaughey was "considered an able and active sapper for difficult duty in the trenches;" a character he well sustained throughout the siege.

Throughout the following night spirited efforts were made to mend the breaches sustained in the day. There were nearly 700 of the line and 82 of the corps given up to these midnight labours. Great as the force was it scarcely fulfilled the immediate requirements of an exacting siege. Mist and rain fell through the darkness, the men were drenched, and the wind swept with unfriendly chills over the hills; but before the morning the damages were nearly all made good in battery and trench to prolong a contest the end of which was still far distant.

As the morning arose with renewed demands and dangers the engineers for the day were early astir, and the works so gravely handled by the enemy's fire still looked haughty and imposing. To a working party of 480 linesmen there were 50 sappers, who, for the most part, were detailed to the 21-gun battery, upon which the fire from the Redan had a mischievous effect. Worn and battered as it was the embrasures were repaired without any appreciable interruption of the besiegers' fire. Between the rounds the sappers leaped into the apertures and built up as much of their cratered faces as the activity they could command permitted. Those working in the left advanced approach towards the crest of the hill overlooking the Woronzoff road were much impeded by discharges of round shot and musketry from the Redan, during which, flying on with the sap, private John Lethbridge and one of the working party were killed. "The conduct of the officers and men," wrote Major-General Jones, "has been such as to merit the warmest

approbation of the Major-General commanding ; the duties on which they have been employed being most arduous and requiring the greatest steadiness."

Next night 87 sappers were in the trenches, and in the succeeding day 60. The 21-gun battery, cleared of its old gabions and fascines, was resuscitated by the morning and fired well in the day's struggle. Advantages always seem to be chased away or ridden over by catastrophes, for a magazine in the centre of the work, visited by a shell which obtruded at the door, blew up and killed a gunner and wounded eight or nine more. Out of about thirty magazines on the right attack this was the only one, after eight days' firing, which broke up and collapsed.

Fifty-five sappers were allotted to the left attack, where No. 9 battery, commenced on the 14th April, was in course of completion. It was cut for six pieces of ordnance ; the rock cropping up to the surface was blasted by some miners of the corps and the broken stones were built into the parapet. Soil to fill the gabions was brought in basket-loads from a sand cave on the left of the second parallel, which subsequently was converted into a magazine for ammunition. Alderson platforms were laid in the battery by the sapper carpenters on the 16th with so much expedition that their usefulness and skill were noticed with encouraging commendation. The battery was completed and armed by the 23rd.

Passing on to the night of the 17th, when 80 sappers were in the lines—28 being on the right and 52 on the left—corporal Joseph J. Stanton and four leading men, with 200 of the infantry, were detailed for the extension of the left demi-parallel situated between the third parallel and Egerton's rifle-pit under Captain King of the engineers. The little brigade crept silently to the head of the sap, and after placing the gabions crammed them with sand-bags passed from hand to hand. As the sappers steadily moved on, the working party broke the ground and increased the cover. In this way, though the soil was very rocky, about a hundred gabions obtained a footing before morning. It was hot work to advance even the length of a yard,

and gabion after gabion torn from the row was gallantly replaced. Constant volleys from the rifle-pit in front compelled the men to proceed with the greatest caution and silence. Persevering in this way till reaching the brow of the hill, they were stopped by an old Russian rifle-screen, which was immediately reversed by transferring the large gabions and sand-bags forming the original revetment to the opposite side. During the operation Captain King was severely wounded in the thigh and expired a few days after. Three of the sappers were also wounded—privates Alexander McCaughey, John Limming, and George Hobson: the last was wounded in the arm, had three or four bullets through his greatcoat, and the frog of his waist-belt carried away. Among the workmen there were five injured. Best able to judge of the exertions of the party, Lieutenant-Colonel Tylden thus wrote of them:—"The conduct of the sappers under Captain King and the working party under Major Welsford, 97th regiment, exposed the whole time to a most galling and dangerous fire, was admirable."

Private Boyland carried Captain King from the trench to the 21-gun battery, and though such an act might fairly have excused him from further duty that night, he returned with all haste to his post. There were still between fifty and sixty gabions to place. Hobson was at the head of the sap, and the firing was close and destructive, for the enemy's ambuscades were only about twenty yards in front. In time Hobson was disabled, and it became Boyland's turn to lead. He was pushing on very successfully, when Colonel Tylden appeared, and seeing that the opposition to progress was excessively sharp, he ordered Boyland to place six gabions at a right angle to keep the enemy's fire from enfilading the new piece of trench. Ready and fearless, he commenced the work; but, in order that it might be finished with greater expedition, he begged, as all the sappers save the corporal who was superintending had been wounded, to have the assistance of any men of the 88th who would volunteer to join him. One was speedily at his service. The gabions were quickly planted despite an unceasing fusillade; but while filling them with sand-bags, the

poor 88th man was shot through the side. Calling for help, an officer sprang up to the gorge, and Boyland and he bore the spirited volunteer under cover. Colonel Tylden, who was never disposed to relinquish a moment's work if he thought it could be employed to advantage, would not permit the sapper, who had escaped so many perils and whose firmness and exertions received his praise, to return again that night to the head of the sap.

Day and night the companies furnished parties equivalent to their strength for the inexhaustible wants of the siege. Batteries misshapen and tottering, put on stubborn and threatening aspects after a few hours' toil. New armaments were made up, new batteries opened; and to ensure their stedfastness, one at least boasted of a parapet 26 feet thick. This was No. 13, a sand-bag battery on the right attack. Approaches by the stealthy boyau were cautiously cut, but invariably opposed by vigilant sharpshooters who held positions in screened defences. For any one work, few only of the sappers could be spared. Half a brigade was in this sap, half in that; two or three were in the right rifle-pits, two or more in the left; nine in the most advanced trenches placing gabions and protecting themselves by heaping up earth from the tops of barren rocks; four at the communication between the caves at the advanced post, and others deputed to an infinite variety of field employment. So passed on the siege to the 19th April; and taking the interval from the 17th, only one sapper, private James Queen, was killed. He was shot through the head by a rifle-bullet. "Up to this time," says the record, "the repairs to the batteries injured by the enemy's fire have throughout been performed in a very satisfactory manner by the sappers, many of whom have been particularly active and zealous." To the list of names already honourably mentioned, must be added that of private James Lancaster of the 3rd company. Being a powerful man, whom no amount of exertion could tire, he was conspicuous for his very good work and coolness in forming a communication from the left of No. 7 battery to the "Ovens." He was the leading sapper in scarping the rock under corporal

Joseph T. Collins, and continued with abiding zeal at this heavy service, though a constant rifle firing was maintained on the work.

The rifle-pits on the left advance sap of the right attack had fatally annoyed the besiegers in their foremost works, and it was determined either to destroy or seize them. With this object they were attacked at half-past nine o'clock in the evening of the 19th April. There were 600 bayonets of the 77th regiment engaged in this nocturnal assault, commanded by Colonel Egerton. When the orders were given, the troops rushed forward, and after a warm engagement for about half an hour, were masters of the pits, with a loss of two officers and several men. Colonel Egerton also sustained a contusion of the thigh. As soon as the covering sentries were posted, Lieutenant-Colonel Tylden advanced with the working party of 150 men, headed by colour-sergeant Henry McDonald and six sappers, under the personal orders of Captain H. C. C. Owen and Lieutenant Baynes of the engineers. The Russian gabions were quickly faced about, the sand-bags thrown down, and after reducing the earth, the enemy's pits were incorporated with a communication which led to the boyau in rear. The lodgment was achieved in about two hours, under a roar of missiles from rifles and ordnance, with so little confusion and so much gallantry, that the affair deserves to be characterized as a dashing exploit.

Colour-sergeant McDonald took the lead in the sap, followed by private Thomas Ewen and other sappers who planted the gabions as fast as they could be handed up. The officers of engineers assisted pressing in their turn to the very head. At intervals they and the sergeant moved among the workmen, instructing them how to fill the gabions and where to lodge the sand-bags. As the sergeant was pushing up the trench, he stumbled over a prostrate officer; and on inquiring, found that Captain Owen was at his feet, dangerously wounded. McDonald proposed to bear him from danger on his back, but the captain, preferring a stretcher for the purpose, one, after a little time, was brought by the sergeant. On this field convenience Lieutenant Baynes and McDonald carried the wounded officer bleeding from the

pit. His left leg was afterwards amputated and he lived to obtain the honours due to his heroic efforts. Finding some sappers in the old trench sending up the gabions, Lieutenant Baynes relieved the sergeant and sent him again to the pits, following himself as soon as he had despatched the captain to the camp; but in forcing to the front, this young officer was mortally wounded in the chest and arm. In retracing his steps, McDonald was astonished to find the working party running from the lodgment. Asking the reason, he was informed that the Russians, in some strength, had driven up to the work and forced them back. At once McDonald ordered them to stand, and after facing them to the right-about, drew his sword and placed himself at their head. Ewen was there ready to second his authority with any amount of daring he might find it necessary to command. Seeing the Russians still creeping over the works, the sergeant desired the workmen to kneel, and after firing a volley, to charge. Strictly obeyed were the orders; the charge was gallantly made, and the enemy having vanished before the cool volley and the bayonet point, the pits were re-occupied and the lodgment resumed. The commanding officer and Lieutenant-Colonel Tylden now appeared, the covering party being about 200 yards away; and on learning what had happened, Colonel Egerton praised the sergeant for his energy and valour. To protect the linesmen from further molestation, the colonel distributed a portion of the covering party in front of the lodgment. Next in command of the workmen, McDonald aided Lieutenant-Colonel Tylden in directing the new trench. Moving to the gorge, still followed by Ewen, he quickly fixed the gabions one after another, intermixing with them the Russian baskets and sand-bags. Just as he had completed the curve at the vent of the sap, Colonel Tylden again appeared, and laid with his own hands the last gabion. The steady and zealous demeanour of the sergeant attracted the notice of Colonel Egerton, who, standing over him, encouraged his exertions by commendations and promises; but he too at last fell back severely wounded by a grape-shot in the right side. Colonel Egerton was near at the time and administered his

brandy-flask to sustain, in a measure, the drooping head of that brave soldier.

Three hours after the pits had been captured the enemy in strong force made a sortie to recover them. So far had they succeeded, that the sentries and workmen occupying the further screen were driven back into the nearest trench; but the lodgment there had been so well managed and its details so well carried out, that the troops holding it made sure work of the defence, and the Russians, pressed at all points, hastily retreated. Now it was that the valiant Colonel Egerton was killed. His promises, however, were caught up by Colonel Tylden, who failed not to make such a representation of sergeant McDonald's conduct as earned for him substantial reward and honour. After the hopeless abandonment of the pits, the enemy, from the furthest screen, which was still in his possession, kept up a constant rifle fire on the sappers and line in the lodgment. Lieutenant James, royal engineers, directed them in their final efforts till daylight, and received, as a sign of his presence, a ball through his cap. He arrived just as McDonald fell; and himself, with that good and constant man Ewen, assisted to bear the sergeant to the rear.

The casualties in the assault were 6 officers and about 40 men. Of these, three were sappers—the colour-sergeant before named, lance-corporals John Evans, killed, and Peter Towell, dangerously wounded. The right arm of the latter was broken, and the amputation which followed ended in his death. This non-commissioned officer had only been wounded a few nights before.

It should be noted to show the ardour of the man, though perhaps in many cases such conduct would be imprudent, that corporal Samuel Cole left his post at the sand-bag battery without orders and pitched into the thick of the fight. In reversing the trench he laboured with great zeal, and while endeavouring to place a gabion in a difficult spot, Evans, a fearless soldier, not to be outdone in prowess, leaped outside the trench and pressed the basket in the line. In this act of devotion he fell by the blow of a grape-shot.

The following complimentary order was promulgated to the corps relative to the assault :—

“ Brigade orders before Sebastopol, April 23, 1855.

“ It was with much satisfaction that the Major-General Commanding received Lieut.-Colonel Tylden's report of the able manner in which, on the night of the 19th instant, a lodgment was effected in the enemy's rifle pit immediately in front of the left advance, ‘right attack,’ under Captain Owen and Lieutenant Baynes, R.E., whose zeal and gallantry were most conspicuous, while the conduct of colour-sergeant McDonald, royal sappers and miners, on the same occasion, when, in consequence of the above-named officers being severely wounded, he was left in charge of the working party, was not only highly creditable to that non-commissioned officer, but so distinguished as to attract the notice of the field officer commanding in the trenches; and the Major-General is glad to find, that the sappers engaged, exerted themselves with their accustomed energy.”

1855.

20th April—15th May.

SIEGE OF SEBASTOPOL.

First day's work in the lodgment—Improvised grenades—Polish fusilier—Capture of the third rifle pit—Preliminary incidents connected with it—Saps issuing from the pits—No. 13 sand-bag battery—No. 9 battery, left attack—Building a magazine in day-time—Constancy of sappers in the trenches—But little relief afforded them—Apparent want of ingenuity in their camp arrangements—Reason why so few sappers die—Their miserable condition—Regimen; its effects—Care of the baggage animals—The means employed to preserve them becomes a vexed question—Kilfe holes—No. 11 battery, left attack—Generals' and engineers' huts—Diversified engagements of the sappers—Death of Lieutenant Carter—Progress of the works—Wells—Repairing the advance saps after a sortie—Expedition to the sea of Azoff—Storms of rain, and consequent difficulties in carrying on the works—Sortie—Effects of the rain—Endurance of the men exposed to it—Casualties.

TWENTY armed men from the 7th foot were appointed to labour in the captured pits on the 20th April, into which for about thirty yards they crawled on their hands and knees. Sergeant Joseph Morant was with them, so also was Lieutenant Sheehy, of the 64th, assistant-engineer, who directed their exertions. Many of the gabions had only been partly filled the previous night, and spaces of a few inches occurred here and there between the baskets. Barely had the linesmen placed their muskets at the back of the trench, when a provoking fire from the near pit and quarries, knocked over four or five of their number. Unaccustomed to work in such slight cover, very little progress was made in improving the trench, and Lieutenant Sheehy withdrew the men. Waiting a short time, twelve sappers arrived; and with four or six volunteers from the 7th regiment, the work

in the approach was resumed. In four hours much had been done to strengthen it, and the parapet, in great part, was made defensible with banquettes. Finding that the trenchmen pertinaciously held to their work, the Russians tried the effect on them of a couple of great guns. The first rounds pitched high; but the next, better aimed, hurled the gabions from the trace, and dividing the parapet by an ugly chasm, separated the workmen into two parts. Those in the left of the pit, struck with stones and half blinded with sand, not seeing their danger, were about to join the main body by crossing the gap; but the warning of their comrades stopped their precipitation and confined them for a time behind a few feet of insecure revetment. Had they attempted to move, not a man would have escaped, for the muzzles of the Russian rifles, only a few yards off, would have struck them down. Hot as was the place, the sappers and volunteers continued to work, and the breach quickly filled up with sand-bags, soon extricated the men at the end of the zigzag from hazards to which less alacrity and courage would have committed them. So jealous was the enemy of any progress in this quarter, it was not an easy matter to throw a few shovelfull of earth over the parapet without a visit from a pair of round shot. That so little harm was done to the workmen was due to the nearness of a Russian screen to the captured pit. Generally the practice was high. To have struck the new approach and not the Russian pit, would have been a nice achievement in gunnery. At last Captain Browne of the engineers, removed the line party, but left the sappers at the end of the trench with orders not to throw anything over the parapet. No exertion being now visible to the enemy, the fire from screen, quarry, and fortress was, in great part, discontinued, and the sappers quietly improved the revetment till nightfall, when another party relieved them.¹

¹ Some young officers—sportive yet enterprising—hearing of the nearness of the Russians to our works, paid a visit to the lodgment, bringing with them loaded soda-water bottles prepared with fuzes. As occasion served they lighted these improvised grenades, and threw them among the enemy's riflemen in the pit. The effect was to increase the fire on the sappers and retard the work. In self-defence the sergeant was compelled to report the annoyance, and the

Before daylight on the morning of the 21st, the furthest screen in the Russian series, about fourteen yards in front of the captured pits, was taken by a detachment of 100 men from the guard of the trenches, under an adjutant, accompanied by a small band of twelve volunteers as a working party consisting of four men of the 19th regiment, four of the 90th, and three of the sappers, under the direction of corporal George Cann of the 7th company. The covering party was directed not to fire but to use the bayonet. All having mustered on the open, the adjutant gave the word to advance. On went the stormers at the charge, and jumping into the screen, which fortunately had been vacated, they took possession of it unassailed by a single shot. Quietly the destroying party set to work, and before returning to the trenches, completely uprooted the ambushade. The parapet had been formed of discarded casks, crested with large sand-bags made of old sails, specimens of which were brought away by the men to show the expedients adopted for Russian protection. The names of the sappers who shared in the sortie were lance-corporal William J. Lendrim, and privates William Harvey and Alexander Hosić.

This service will bear a little elucidation. At dusk the previous evening, the four sappers went into the trench issuing from the first captured pit, to reconnoitre. Each selected his own place to look out, but Harvey having crawled round the head of the sap on all fours, watched for a few minutes the operations in front. The Russians were busy in the screen, and seeing one more bold than the rest strengthening the parapet,

General of the trenches gave orders that none should enter the pits except on duty.

A Polish refugee, belonging to a fusilier regiment, also came to the screen under the auspices of the young officers aforesaid. A hole was made for him to speak through, and addressing the Russians in their own language, his jargon was discourteously treated with laughter and a few angry shots. Renewing the interview the fusilier, after saying some extravagant things to induce the riflemen to desert, concluded by intimating "they were great fools to remain where they were." Another volley was the result of this candid but indiscreet communication; and of course the Pole was forthwith expelled from the trench.

Harvey remarked, as he returned to the trench, it was strange that the sentry, a man of the 88th, did not pick him off. He was a Milesian was the 88th man, and a good deal irate to think that, though he felt sure he could lessen the number in the pit by at least the head which dared now and then to overlook the parapet, he was under orders not to fire: but when he learned from Harvey that the pit was to be captured in the morning, the sentry, forgetting his orders, discharged a bullet at the Russian, and thus brought on a fire which produced a number of casualties. Taking up the arms of a wounded man, Harvey, mounting the parapet with others, blazed away till he was called from the summit by Lieut.-Colonel Tylden to answer for his conduct in bringing an unnecessary fire of musketry on the sap. He had been reported by the officer of the line on duty there as the cause of it; but a few words of explanation made clear the misunderstanding, and Harvey, the first to volunteer for the assault, was so conspicuous in his exertions to raze the screen, that he was subsequently distinguished by a medal for gallant behaviour, and received a gratuity of five pounds. It was well that the firing took place as it did, for to its warmth is no doubt attributable the evacuation of the pit without a hand-to-hand encounter.

It was not long before these pits were incorporated with the besiegers' works by communications hastily thrown up and revetted despite the accurate firing of the enemy's riflemen; and they held so prominent a place in the tactics of the engineers, that in an after period they formed the outlet for a sortie upon the celebrated quarries. A flying sap from the screens was early extended to the left as far as the rim of the hill overlooking the Woronzoff road, and again to the right, in line with a row of pits still possessed by the Russians, and which run along the whole extent of the quarries. The cover in the lodgment was almost made impenetrable by the sappers who erected a wall of gabions, sand-bags and stones intermixed, as far as the very edge of the ridge.

On the right attack, No. 13 battery for four guns was finished and armed on the night of the 21st April. It was

situated to the left of the second parallel near the Woronzoff ravine. Between eight and ten thousand sand-bags swelled its dimensions into a noble field construction. The men of the corps who gave it form from the engineer's trace, finished it off with something like artistic neatness. The defences of the battery were improved by the addition of lock traverses across the boyau on its left. This was perhaps the first battery built during the siege entirely of sand-bags; and though well ploughed with shot and shell, it made a fair resistance. Its bags frequently burst, and gaps were often made in its puffed-up features, while the pent-up sand was showered over the battery as if winnowed by the wind. There was no lack of the reliable sand-bag, however, and the damages sustained were always expeditiously repaired.

During the same night the embrasures of No. 9 battery on the left attack were nearly all cut through by the sappers and the openings covered up again with masks before daylight. By the 23rd, at night, the remaining mouths were opened and the checks of all were flattened by a few parting slashes of the spade. Grim guns occupied the spaces, and at the proper moment No. 9 co-operated with the other works in shelling the enemy's defences. In the formation of the battery, corporal Robert Hanson of the 7th company, displayed great zeal and ability in superintending a detachment of the 50th regiment, of whose exertions more than once creditable mention was made.

So well in range was No. 10 battery on the left attack it was hazardous to venture into it. Still it was necessary to furnish it quickly with a magazine. To obtain the chance of executing the work in day-time, a temporary blind of sand-bags was thrown up in front of the site during the night, and the sapper carpenters and miners took their stations behind the screen at dawn. The delving and blasting for a durable foundation were done in broad daylight; then up went the frame, and the sheeting followed, covered for a roof with timbers, sand-bags, and earth; and in a few days, without casualty among the builders, the magazine was completed.

Whatever accidents or failures in arrangements took place

with the line contingents by which they were late for the trenches or not provided, the sappers always appeared in the lines and turned to the work with great ardour. As an instance, it may be mentioned, that the trench party of twenty-eight sappers were, on the 22nd April, three hours in the batteries before the morning relief arrived, during which, besides attending to various matters of essential detail, they levelled two crumbling embrasures in the 21-gun battery, and rebuilt them for action with stout revetments in little more than two hours.

Too inexorable was the siege to allow any relaxation in the development of the lines, and every day added to the accumulation of posts and duties which called for the anxious attention and valorous exertions of the engineers. The officers were severely wrought and the casualties among them spoke of their labours and exposure. The sappers likewise were greatly overtasked. Some nights they were in the trenches as long as the darkness lasted, and then only left to repeat their long vigils the ensuing night. Next day, perhaps, they would be permitted to rest for a few hours, when at noon some camp duty, some hutting or draining, the making of fascines, or the execution of a tedious round of *et cetera*, absorbed the remaining portion of the day. The approaching night or the next, again saw them at work in the far-spreading trenches. For several months this was their constant routine, when, happily, reinforcements arriving, they were, in degree, relieved from an excess of fatigue and watchfulness which, were it not for their hardihood, would have considerably diminished their weak files.

It has been remarked that the sappers exhibited less ingenuity and application of resource in their camp arrangements than many regiments in the Crimea. Much skill was shown by some corps in the use of contrivances and rural expedients for rendering their locations comfortable within, and pleasing and picturesque without. All these devices were strangely absent among the sappers. Oddly enough this seems; but it is easily accounted for by the fact, that the men, more constantly at work than other troops, were too tired to seek for superfluous

comforts when ordinary ones satisfied their few wants. Indeed they had no leisure to busy themselves about extraneous conveniences.²

Overworked as the linesmen were, the regiments possessed facilities for carrying out domestic minutiae which wore off the rougher asperities of a trying campaign. To most of them washermen were appointed who attended to the concerns of the regimental laundry and ensured to the men the comfort of wearing clean linen. Such was not the good fortune of the sappers. Every man was wanted for some absolutely pressing duty, and it was only when the caprices of chance threw in their way a vagrant interval that they could seek to afford themselves the companionship of a well-washed shirt. From this cause it can occasion no wonder that the men were often foul and distressed by vermin. In this condition there were not a few who would steal at times into some cave to relieve themselves in silence of the loathsome brood. No perseverance, however, was sufficient to free them from the creeping things which swarmed in every seam and around every fretted hole of their threadbare clothes. So extreme was this discomfort felt by many poor fellows, that a general officer of the corps, who took great interest in the feeble and attenuated invalids as they landed at Portsmouth from the Crimea, was constrained officially to represent the pitiable state in which he found them. Comparatively of all the troops they were the most miserable and sympathising with their misfortunes, the general and his benevolent lady generously supplied the sufferers with clean linen and apparel.

Then, again, though sufficient food was afforded them, it was not of that description and variety to give the pioneer adequate strength and cheerfulness to bear up against his depressing toils.

² This suggests the mention of a brief conversation which occurred one day between Colonel Shadforth and lance-corporal Jenkins. "How is it," asked the Colonel, "that so few sappers die?" "They hav'nt time," replied the corporal; "there's too much work for them to do in the trenches!" A stiff glass of grog from the officer's canteen was the result of Jenkins's rejoinder, which would have been strictly true, had the question been asked with respect to the primitive state of the sapper camp.

Hard biscuit, salt beef and pork formed the staff of the military regimen. Now and then they enjoyed the luxury of tasting fresh meat. None of the sappers at this time could command sufficient relief from front duty to master the mysteries of the *cuisine* so as to manufacture anything like a relishable meal. This was left as an achievement for after times when the inimitable Soyer superintended the military kitchens. Many hardy men at last broke up; and one hale fellow—the type of many more—in alluding to his trials on account of the rations, observed, “My teeth are the only parts that are failing me!” Hardship was unequal to make an inroad upon that strong man’s frame, but flinty biscuit and tough beef spoiled the efficiency of an apparatus which, under other circumstances, might have stood his need for half a century. He then added, “all the money I can get goes for soft bread to ease my teeth and mitigate the aching of my jaws. The French come round with it almost every day, and we give 2s. 6d. and sometimes 3s. for a three-pound loaf!” Those indeed were hard times and the prices such as would be excessive in a famine.

If there were reason to complain of the want of fresh meat none could be alleged against the quantities of rations supplied. While the troops were suffering great privations, the sappers always had full provisions and “when warm clothing was available for them it was brought up without delay.” This arose from the mules furnished for the engineer field service having been planked up in sheds at Balaklava in the early campaign and carefully attended to. In the fatal winter that followed, the engineer mules were thus protected from its rigours, while the unsheltered baggage animals of different corps, and even the troop horses, fell dead in frightful numbers at their tethers. The great storm of November, 1854, rendered the animals almost powerless and the little strength they possessed wholly gave way when the slightest pressure was applied to derive from their employment any urgent assistance. Nothing on the other hand baffled the few mules attached to the engineer department but the conveyance of the huts; and this

^a Sir John Burgoyne in letter to the ‘Times,’ May, 1855.

was a service so extremely heavy, it was utterly beyond their capabilities. To corporal Matthew Stevens was attributed the preservation of the engineer transport stud. He had with him a small party of sappers who soon turned themselves into efficient drivers, and emulating the energy and care of the corporal, assisted to produce a result which became a striking incident of the campaign.⁴

So effective an adjunct of the siege was the rifle screen, that on the left attack four pits commanding the Woronzoff ravine were commenced in front of the second parallel on the night of the 22nd April and daily additions were made to the number. A fortnight later other pits in the same attack were made extending from the right of the second parallel to the front of the third, and also from the right flank of No. 8 battery. The chain consisted of forty holes spotting the ground with light troops in snug and commanding positions. These were commenced by Lieutenant C. G. Gordon of the engineers, with a force of 180 linesmen and a proportion of 24 sappers who were that night allotted for the works. In time the pits became an enlarged item in the system of attack, and formed, occasionally, the starting points from which new zigzags or parallels were struck out. Old pits, moreover, which had been abandoned by the Russians—as the besiegers' works compressed their circumvallation—were taken advantage of and turned against them.

Corporal John Landrey, a very good sapper, was noticed for his zeal and intelligence in leading and instructing the working parties on the 24th, and sergeant Benjamin Castledine, while visiting a working party in the extended parallel to the right of the mortar battery on Gordon's attack, received a bullet wound in the hand.

⁴ The means taken to preserve the engineer mules was referred to in the Second Report of Sir John McNeill and Colonel Tulloch to the War Minister, as an instance of what other troops might have done had they exercised common "promptitude or ingenuity." It afterwards became a vexed question, and a Court of Enquiry, conducted by seven distinguished General Officers, sat for many weeks at Chelsea Hospital, to ascertain, among other matters, whether any blame was fairly attributable to the officers in chief command for neglecting the use of expedients to save the horses. The enquiry terminated fully exculpating the officers.

Battery No. 11 for seven guns was begun in the night of the 27th on a rocky eminence, somewhat isolated though imposing, to the left of the second parallel. Ground was broken by 300 of the line and 50 seamen with as many sappers as could be taken out of 35 detailed that night for the trenches of the left attack. Captain Porter had the direction of the work. All his arrangements were so admirably carried out, that the parapet—256 long—was risen to a height of six feet, and the two right gun portions and epaulment, worked as a half sunken battery, had a parapet nearly twelve feet thick revetted with sand-bags. Nor was this all; the remaining portion of the battery, shaped after the elevated form, was revetted partly with casks and partly with gabions, and obtained a thickness varying from seven to nine feet. Receiving no little access of spirit from the joyous exertions of the happy sailors, the men worked hard and excellently, but at the period of relief they left the battery jaded and exhausted. Sergeant Jarvis, and lance-corporals Hanson, J. T. Collins, and Jenkins of the sappers, acquired the credit of having laboured splendidly, which was recorded to their honour in the orders of Major-General Jones. A constant and irritating fire was directed against the workmen the greater part of the night, but the result when summed up, was one slight wound, and the smashing of six stands of arms.

A few nights later Captain Armit gave orders for the earth of the battery to be thrown well to the front. With a manner less absolute than persuasive, Sergeant Drew, who was in charge, requested the workmen to go on the parapet for the purpose, but they refused, alleging, "it was sappers' work." The moon was shining bright in the rear, baring the battery to Russian fire and rendering the duty anything but inviting. Taking Rowland Hill's plan of doing the work himself when his servants quarrelled about their legitimate portions, the sergeant laid aside his jacket and pushing on the merlon toiled away like a navvy. Distributed to various details of the battery, the sappers hearing that the working party had declined to assist, left their several tasks and joined the sergeant. This was more than a

brave rifleman could well bear, and with an example that none of the workmen cared to imitate, he attempted to take his place with the shovellers; but a sapper who happened to be below, altogether averse to accepting any services which seemed to spring from other considerations than duty, pulled the rifleman down, observing, in tones of sarcastic resentment, "that, as the work was, according to the opinions of the party, purely sappers' work, none but sappers ought to share in the credit of its execution." The strengthening of the merlon, therefore, that night, with heavy discharges of shot and some shell directed against it, was wholly carried out by sergeant Drew and his sappers.

Before the end of April, a few men of the corps assisted by working parties completed a hut for the general officer of the trenches on the right attack with stout timbers and sheeting and gave it as much proof with sand-bags and earth as practicable. A similar chamber was reared soon after for the general on the left. Considering its position it was a cozy quarter in the storm, and its social character was enhanced by the introduction of an old door and a glazed window screened from fire by a traverse. All that it wanted was a stove and the wreathing smoke from a chimney-pot to make it a palace for a peasant.

The engineer hovel of the left attack—used as an office by each succeeding engineer as he took possession of the trenches—exhibited some points of needy refinement; for it not only possessed a door and a glazed sash, but a stove with a pipe leading through the splinter proof roof which boasted a covering of asphalted felt! From a sunken foundation the hut rose up under a broad parapet in the first parallel between Nos. 1 and 2 batteries, and was built chiefly of sand-bags with an interior nearly ten feet square fitted with the bare conveniences of seats and a desk—all, however, sufficiently rough to identify the structure with the rigours of a stern siege. In the area in front of the hut was a sort of engineer *dépôt* from whence the tools and materials were distributed to the working parties.

Meanwhile the sappers in small batches or in ones and twos

were lost among the military operatives, distinguished by the badge of a piece of tracing tape around their caps. Usually in the 21-gun battery were found the greatest number and half a brigade or so of selected men could be counted in each of the new batteries on the right attack. These run from 10 to 14. On Greenhill the works also claimed a share of sapper labour, but in the batteries numbered 10 and 11 on the left, the parties, as far as strength was concerned, were more ostentatious.

To be a little precise, let a survey of their engagements be undertaken. Look first among the embrasures, and there, ant-like, is seen an isolated red-coat coolly pegging up hides or fixing gabions, while two or three carpenters, with upturned sleeves, are discovered crouching low, fixing platforms or renewing sleepers and fighting bolts. Go next to the caves and call—"Sapper?" One immediately emerges from 'its murkiness, spade in hand, with begrimed face and dishevelled beard, to show the quality of his exertions. Step to the saps right and left, and in each on bended knee with whirling pick and cap well down is traced the sapper. To his sturdy efforts the earth yields and the gabion soon is filled. Watch him as he goes ahead with cautious crawl and daringly places another basket on the line. How many rifle balls, how many shots fly past, few can tell; but on he urges as if nothing had occurred, and perhaps the next discharge kills him. Steal now along the trench to its advanced limit, and there is seen a group of busy miners black with gunpowder in shallow depths, blasting the rock to deepen the approach and strengthen the cover. How well they know their art. Not a head is seen above the young parapet and scarcely that of a hammer; but when a strong blow is required, up it goes and the sun sparkling on the burnished steel gives a mark to the enemy. Bullets from the screens are quickly fired and an occasional shot trundles in among them, but undauntedly they proceed, watchful as dogs, till at last the mine explodes. A volume of vapour affords another indication of their activity to the enemy. Shot and shell plunge on and tear up the ground, but the miners have

flown to a distance and quietly await the cessation of the fire to resume their tasks. Walk over to the sailors' battery where surely none but seamen may be seen. There, in truth, the blue jackets are in droves with their droll sayings and unsteady gait ; but press forward. " Is that a marine ?" " No, it's a sapper trimming the parapet." There, too, is another tricing up the flaccid cheeks of an embrasure ; and beyond is a third giving position to platforms for sea-service mortars or naval guns. Go round that traverse : the universal man is there completing it ; another is strengthening the parapet ; another repairing the merlon ; a fourth is in the right epaulment ; a fifth in the left ; a sixth is elsewhere constructing loopholes with barrels ; others are revetting the works with tubs, casks, gabions, and hide-bags, while a couple of broad-backed miners are burrowing underground and driving a tunnel into the jaws of some convenient cavern. The tour is incomplete without a visit to the pits. Come with the night relief and see them. Jump into that screen ; there again is the sapper enlarging loopholes or picking the rock to sink the pit. Plunge into the next one : there too is the military Tonson improving the cover with stones while the eager riflemen jostle him as they press forward to get a chance shot at some unwary Russian. Enter now the 21-gun battery where four magazines are rebuilding. The sappers are quite at home raising the frames by the sickly beams of a feeble siege lamp ; but look, a flying stone has just broken the horn and the wind has extinguished the flame. Yet, undiscouraged, the sappers work away by feeling the points and bases of their timbers. Go where you will, in battery, trench, or mine, a sapper is the centre of each party toiling at his hazardous vocation through the long dark night. Daylight has returned. " What can that moaning noise be ?" A 13-inch shell has dashed against a magazine and blown it up ! The gunners are maimed, suffocated, or killed ! and the timbers are either carried away or left charred and tottering on the rock. Run and see the effect. The magazine is a ruin, the ground smokes and burns, and the dead and mutilated are being borne away ; but there again are the sappers tearing through

the smouldering frames and fallen planks, examining the extent of the disaster and preparing for the restoration. "These men tho' few in number seem everywhere and in everything. What can be their motto?" "Ubique quo fas et gloria ducunt!" "That accounts for it."

At midnight on the 2nd May, a sapper was putting a new face to the embrasure of the flank gun in No. 8 battery, on the left attack, when a round shot ploughed the crest of the parapet on its right flank and struck down Lieutenant Carter of the engineers, killing at the same moment Lieutenant Curtis of the 46th regiment. The flying sand bespattered the workman but he was else unhurt. Quitting the embrasure, he sought by his attention to lighten, if possible, the mortal throes of his officer. In a few moments all was over, and the sapper, with grave sympathy, bore away the body of that brave young man to the camp.

With the morning relief of the 3rd, 60 sappers were sent to the trenches, who in addition to the duty of overseers laid plat-forms in No. 14 and the 21-gun batteries. Sergeant Philip Morant, while superintending on the right, was slightly wounded in the shoulder by a rifle bullet, which, being almost spent, bounded back after delivering the blow. This was his first day in the trenches. No. 1 battery on the left attack, which was much cut up, was completely renovated by thirteen sappers; and four miners performed good service in blasting a communication to the ammunition caves. In the ensuing night the advance boyau to rifle-pit on the right attack was prolonged and strengthened, and a strong party of the corps worked with acknowledged energy in constructing No. 12 mortar battery on the left. Some also were with a line party adding solidity to the broad parapet of No. 8 battery, who, however, were subsequently removed, as the clear moon, shining in a cerulean sky, exposed the men to an annoying fire of grape from the Redan. Two nights later, there were forty-three of the corps in the trenches; twenty being scattered in the right works, and twenty-three in the left. A sortie on the left sap of the Gordon attack interrupted the operations, but the enemy was driven

back without effecting any serious detriment to the works. A heavy fire of shells was also directed against the 21-gun battery, and though the casualties for the night amounted to 4 killed, 18 wounded, and 2 missing, none of the sappers were touched. At the time of the attack eight rank and file of the corps were in No. 14 battery repairing embrasures, 1 in the second parallel making loop-holes and patching up the parapet, 2 in No. 8 battery replacing dislodged sand-bags, and 2 in the 21-gun battery filling up the chasms in the fourteenth embrasure and altering the features of the twentieth.

About an hour after midnight on the 8th, sergeant Drew had dismissed a working party under charge of second-corporal Fraser employed in forming rifle-pits in advance of the third parallel. Retiring together, they resolved to visit the caves known by the name of the "Ovens," then the post of the advanced picquet, to see a communication, which had been much talked of by the sappers, cut through the solid rock by private Simon Williams, by which an unexposed track was open from cave to cave. They were dressed at the time in Mackintoshes, fur caps, and long boots. The officer in charge of the picquet at the "Ovens," apparently unaware that works were in progress in his front, was struck with the intrusion of the visitors and captured them as spies. Speaking good English was no proof they were not Russians, and accordingly they were sent to the field-officer of the trenches, Lord West, under a strong sergeant's escort. Trying to guide it by a nearer way than the one it was taking, was received as a certain indication of their character, for the guard fancied "the spies" were planning to beguile them into Sebastopol. Indeed they had some misgiving that the two sappers were a couple of clever desperadoes, ready for any cruel work that their evil natures might prompt them to perpetrate. The escort therefore marched, brimful of caution, with the prisoners, and were only too glad, on reaching the goal, to be rid of such a pair of suspicious adventurers. On being confronted with his lordship, he asked them many searching queries, to which they gave remarkably accurate replies; but the question of their identity was at length settled by

Captain Armit, the engineer officer on duty for the night who had just returned from the rifle-pits by another route. Of course they were at once released, and many a good laugh was enjoyed at the pardonable blunder of capturing two honest sappers as Russian spies.

Water in the trenches had now become scarce ; indeed, the cisterns in the 21-gun battery, formed of barrels, were dry. This gave rise to the prudent precaution of sending the working parties to the lines with full canteens. New wells were immediately sunk by the sappers in the quarries of the 21-gun battery, and cans, barrels, and metal powder cases deposited in promising spots along the parallels, to allure the springs to the desired outlets. Very limited was the area for exploring, and the water therefore was never sufficiently plentiful to relieve the workmen from the necessity of filling their water-bottles prior to entering the batteries. About a fortnight later, the well in the second parallel on the right attack yielded a fair supply. It was a sort of pool of Siloam for the weary and thirsty, and to shield them from casualty in their pilgrimage to it, the assiduous efforts of 4 sappers and 20 linesmen threw up a parapet with sufficient altitude, to afford them convenient shelter.

During the darkness of the 9th, a sortie was made by the Russians which was gallantly repulsed by the guard of the trenches on the right. The Russians left many dead on the field, while the casualties among the besiegers did not exceed 13 wounded. There were 20 sappers in the right works at the time, who, as soon as the sortie terminated, were doubled up to the left advance saps, and before the coming relief, replaced the gabions and sand-bags which had been capsized and plugged up all the gaps and shot-holes in the parapets. That night a new communication was begun from the second parallel to the right advanced trench. Eight sappers were employed in heading the sap and lodging the gabions, of which no less than 150 were firmly fixed ; and the cover obtained was such that the exertions of the workmen were justly praised. The work was on the slope of a hill exposed to an oblique fire ; and though difficult to form the parapet at the extremity from the presence

of rock, it yielded at length to perseverance which was as constant as intrepid.

The tenth company under Lieutenant-Colonel Gordon and Major Stanton of the engineers, were afloat in the 'William Jackson,' with the expedition to the Sea of Azof from the 3rd to the 8th of May. Without attempting operations, the troops were suddenly recalled, and landing at Balaklava on the 8th, the sapper contingent marched two days later to their old places in the trenches.

Rain set in on the night of the 10th and turned the lines into wet ditches. Working parties, furnished as usual, persevered in vain to make way against the drenching storm and the strong wind that blew. Every step buried them over their shoe-tops. Returning to camp, wet and miserable, with soaked beards swabbing their breasts, not a few seemed by their bemired appearance, as if some catastrophe had rolled them in a marsh. Throughout the day of the 11th the rain continued to pour; the mud had much increased, and sheets of water stood in the batteries and parallels at places where hollows or uneven ground favoured such accumulations. The soles of the embrasures were ankle deep, and seams were made in the merlons and roofs of the magazines by the wearing flow of the rain. The sappers and working parties again held their places in the batteries, for nothing excused them as long as there was a chance of making progress, however trivial. Much was attempted, but little succeeded beyond replacing some overturned gabions and patching up rifts in some of the more important constructions. Sergeant Kester Knight, and a small force of carpenters on the right attack, toiled with exemplary zeal at one of the magazines of No. 14 battery; but their progress was at length interrupted by a considerable portion of the timber prepared for the work having been abstracted. Some of the beef barrels, likewise, wanted for revetments in other parts of the trenches, were unhooped, and the staves captured for camp uses by the working party. Strange that men should sacrifice to personal objects the very means provided to give efficiency and success to the operations for defending them!

On the night of the 11th no working party was provided the weather being fearfully stormy. There were, however, 24 sappers, heavily clothed in long boots, overcoats, and waterproofs, dispersed in the right trenches under Lieutenant Graves of the engineers, who worked through the darkness unsheltered from the rain. One brigade was extended in the new communication on the right, in front of No. 8 mortar battery, blasting the rock and building the loosened boulders into the parapet; another brigade was in No. 14 battery, attending to the magazines and embrasures and clearing the choked-up channels for the passage of the water into the ravine. Eight carpenters were engaged for awhile in laying platforms in No. 12 battery, but the rain fell with such heaviness, that the spaces prepared to receive the sleepers were soon inundated. In this extremity the men made furrows in the sloughy ground, and thus drained the sites to permit them, when the storm should abate, to resume their tasks.

Nothing, it would seem, was enough to induce the Russians to seek repose; rather, indeed, the presence of storms, the more angry the better, whetted their spirit for activity and assault. Two hours before midnight they opened a sharp fire of musketry, accompanied by a cannonading of shells upon our works, which was stoutly met by incessant volleys from the guard of the trenches and five guns in the 21-gun battery. On the left attack, where Captain Hassard was on duty, there were only four sappers to carry out his orders. But little could be expected from such initial means in such a supremely dismal night. In about two hours, however, under a constant torrent, they altered the flank embrasure of No. 8 battery, to enable its gun to play into the extreme Russian rifle-pit on the right. Just as they had finished, corporal Thomas Kirkwood, who had subordinate charge of the party, heard the bustle of an approaching sortie. Communicating the intelligence to his officer, Captain Hassard flew through the zig-zags and parallels and had the guard of the trenches in readiness to meet it. This was barely accomplished when the enemy tore up the hill from the rifle-screens in the Woronzoff ravine. Now they were near

the parapet, and about to enter at its most accessible points; but so close and prompt was the resistance they received from the works that a hasty retreat was the consequence. Light balls, thrown from a Cohorn mortar in No. 7 battery, discovered a second column pressing to the centre of the advanced parallel. A few, more daring than the rest, even jumped into the trenches; but the vigour of the besiegers pushed back the assault with severe loss to the enemy. No. 1 battery opened on the quarries, No. 2 on the Redan, and some effective rounds were fired from the flank gun of No. 8 battery by Captain Collingwood Dickson of the artillery. The loss sustained by the British was 1 officer and 5 men killed; 1 officer and about 30 men wounded. The four sappers being unarmed, were withdrawn to preserve them from danger.

Where sand-bag revetments had been used, the havoc committed by the tempest was general. Want of slope was the cause. Being early constructions, they had not shared in the improvements which experience had subsequently introduced. Some of the works, loosened by degrees, fell down and encumbered the trench. The surgeon's hut was a ruin. Sixty-four sappers were appointed to the trenches on the 12th May, to make good the damages. In a day or two the medical quarter in No. 2 battery on the left was rebuilt by 17 sappers; the huts for the generals were repaired and strengthened; the embrasures and magazines mended, and all the revetments strongly bolstered up and properly battered. The draining, moreover, was enlarged and considerable advancement made in all the details of the new batteries. Blasting rock on the left was a special feature in the day's labour. Twelve sappers were employed in the duty in No. 11 battery, and in front of the inner ammunition cave, from which they also constructed a ladder to the shaft leading to the trench above.

Showers were frequent during the day and heavier in the following night. No working party was provided, but 20 sappers under Lieutenant Drake, who seemed to be invulnerable against inclemency, were far away in advance draining the approach to the right rifle-pit in the Gordon attack.

Against the darkness and rain they endured with commendable resolution, and though restricted by the storm in their exertions, nevertheless afforded an instalment of relief to the screen. A few of the most energetic and skilful also rebuilt, in the 21-gun battery, an embrasure which had been washed down by the rain.

So went on the works to the 15th, when private Reuben Wiles, one of a few miners employed in cutting rock at the caves on the left attack, in connection with the left boyau, was wounded. During the preceding night, the heavy firing from the Creek batteries had upset several of the gabions and made a wide breach in the parapet. It was when passing this gap, bearing gunpowder and fuses for blasting purposes, that a round shot, striking the broken angle of the trench, tore away a sand-bag, and threw it full at the chest of the miner. Wiles, who was knocked down by the blow, was also covered with a shower of stones; which, besides bruising him in different places, made a gash across his nose, contused one of his eyes, and wounded him in the right knee. A similar accident, the following night, wounded private Edward R. Hodgkinson severely in the head.

1855.

16th May—7th June.

SIEGE OF SEBASTOPOL.

The batteries—Stoical tranquillity in blasting rock—Round-hill or fourth parallel—State of the works—Siege materials and expedients—Corporal William Swann—Expedition to Kertch—Second international communication—No. 15 battery on the right—Rope mantlets—Hospital caves—Companies reviewed by General Jones—French officers' opinion of the corps—Repairing right rifle pit—Arrival of ninth company—Progress of the works—Third bombardment—Bravery in the embrasures—Corporal Stanton in the batteries of the second parallel on the right attack—Casualties—First appearance of ninth company in the trenches—The sailors—Voluntary resolution of Corporal Lockwood and his sappers—The engineers—Inobtrusive devotion in an embrasure—Adam McKechnie—Death of Captain Dawson—Selection of old sappers for front duty; their sterling exertions—Labours in the batteries; platforms—Magazine blown up—Russian plan of extending their trenches—Capture of the quarries and white works—The lodgment—Death of Lieutenant Lowry; bravery of corporal Stanton—Casualties—Lord Raglan's approbation of the sappers—Infernal machines in the quarries.

By the 16th May all the batteries as far as No. 14 on the right, and Nos. 10 and 11 on the left, were finished and provided with pieces of heavy artillery. No. 14, founded on a bed of rock, was strongly built in the centre of the second parallel, and the cheeks of its embrasures, formed in the ordinary way with gabions and sand-bags, were lined with hide-bags. No. 10 was partly revetted with stones; and No. 11, from the hard nature of the ground, occasioned considerable difficulty in its construction, inasmuch as mining—a tedious operation under fire—was constantly resorted to to procure cover. It was chiefly revetted with casks and gabions. The two latter batteries were also built in the second parallel, the former to fight the barrack battery, and the latter, rising from a trench

which run out at right angles from a backward bend of the parallel to the crest of a precipitous cliff, raked the Picket-House ravine and the cemetery, and plunged its shells into the works at the dock-yard creek.

Soon after commencing No. 11, the firing into it was very hot one morning. Corporal Hollis had charge of 200 men engaged in various details connected with its progress, the bulk of the workmen being scattered over the shelving rocks of the ravine in rear, collecting earth from the nooks and hollows to fill the sand-bags. Shells played on them from the bastion du Mât and an unseen battery near the creek, which killed three men and wounded four others. Grumbling at an exposure which was considered to be uncalled for, 150 of them were withdrawn; and as the 50 that remained scarcely cared to prolong a stay which cost them now and then a casualty, it was pleasant, amid so much hesitation, to see one cool fellow doing his duty. Private Clubb, who was drilling a hole to blast the foundation for a platform, was sitting behind a full gabion that blinded the neck of a partly-cut embrasure, and being intended for a sea-service gun, it had a genouillère only about a foot in height. Presently he was covered with earth by a shot which struck the gabion and passed a few inches over his head into the ravine in rear. "That's close shaving, Hollis," said he, looking up with a calm smile without losing his hold of the jumper; and thinking the incident undeserving of any further notice, he retained his seat and resumed the boring with as much unconcern as if he knew nothing of fear.

A batch of rifle-pits on the left attack, commenced in front of Nos. 7 and 8 batteries, subsequently became an extended series of screens, spotting the ridge on its very brow, each connected with the other by an approach, which, in time, encircled the hill and formed a continuous line of intrenchment for musketry fire within fair range of the enemy's batteries and quarries. As the nights were bright, a heavy cross fire of shells and grape was constantly poured upon the sappers and workmen, that rendered the operation as trying as perillous; but it well repaid the trouble and courage exercised in its construction, as the

riflemen picked off the Russian gunners, and thus silenced some of the ordnance which cannonaded the trenches from the Redan and barrack batteries. The round-hill trench—an astonishing achievement of persevering skill and courage, formed, for the most part, through rock at an extraordinary outlay of labour, under very adverse circumstances and interruptions from the galling play of musketry and artillery—was designated the fourth parallel, and though it was at no time armed with a battery, it was mailed at all points with selected light troops.

Every hour made obvious the necessity of hastening the termination of a struggle which had swallowed up an army in its checkered events. The secret of success in a siege, next to good generalship, is expedition in the construction of essential works and attention to their efficiency. This was ever borne in mind; and though opposed by astounding obstacles, never a day passed but a sensible addition was made to the vast network of trenches. Parallels and approaches now covered the hills, and saps daringly progressed in front. Dingy pits filled with groups of prying and fatal marksmen studded the advances and flanks. Caves were augmented in size and number in the sides of the ravines to give safety to the gunpowder, and shell-rooms were constructed to hold the combustibles. All existing batteries were maintained intact and new works by degrees were thrown up in front to grapple with the sturdy formations of the Russians. As they were finished, the masks which blinded the apertures were removed, and heavy guns, peering through them, flashed on the enemy's works. One hundred and sixty-five guns and mortars of all weights and calibres were in position, and the average distance of the advanced batteries from the Russian lines was, on the right, for 11 guns and 5 mortars, 360 yards; and on the left, for 20 guns and 3 mortars, about 460 yards.

Many were the expedients introduced to supply the absence or deficiency of the usual siege materials, or to take the place of established contrivances which had now proved their comparative uselessness. The Madras platform fully gave place to the Alderson invention. Iron-hooped gabions were resorted to

with increased favour for revetments, but as it was found that the earth—when its moisture had dispersed—riddled through the hoops and lessened the amount of protection they were calculated to afford, the precaution was taken of packing them with bags filled with sand or small stones. Wicker baskets, which had held an immemorial reputation, still maintained their fame, but the constant drain on them had wholly impoverished the parks. Not a stick could be gathered in the vicinity to augment the supply, and Balaklava and the neighbouring heights and hollows were hopelessly explored for brushwood. Saplings for the purpose were therefore brought from Karani and even from Constantinople and Sinope. Hide-bags now seemed to outvie with the canvas ones, and sheets of tough bull's skin were picketed to the cheeks of the embrasures to save the gabions and fascines from taking fire. Nevertheless, the sand-bag—the ancient ally of the brushwood gabion—stood its ground, and to economize its expenditure, beef and powder barrels, casks, and tubs were used in the shady parts of the works. Fragile things, too, were the sand-bags, for they frequently burst by concussion or the influence of the weather, and, moreover, required nice adjustment to make them lie effectively. From the pressure behind they sometimes tumbled down. The doctor's hut, from this cause, fell with a crash and more than astonished the busy occupants; and to obviate the recurrence of similar disasters, a greater slope was imparted to the parapets and walls. Two guns were spread over the space allotted to three, which greatly enlarged the mass of the batteries. The magazines were formed of a triangular shape as being less liable to injury than the quadrangular ones. Splinter proofs were raised in all the works to protect the artillerymen when not working at the guns and afford them shelter from the burning sun or pelting rain. Parados were erected in the batteries to shield the workmen and others from splinters and flying stones set in motion by bounding shot or bursting shells. A crusade was also entered against banquettes except where indispensable for defensive positions. In other situations they reduced the amount of cover which a safe parallel or communi-

cation should possess and subjected the besiegers to unnecessary casualty. Copying the Russians, loop-holes were made to the rifle-screens in the body of the parapet, and the simple but hazardous employment of sand-bags for this purpose was in great part abandoned. Other refinements were also introduced by this time. Sun-shades and *tentes d'abris* were scattered in profusion through the works; but however excellent were the conveniences thus afforded, they did not escape an occasional removal, to convert the props into firewood, and the canvas into long under-gaiters, waistcoats, or towels.

Corporal William Swann, who had distinguished himself at the battle of Giurgevo, was severely wounded on the 20th by a grape-shot while in the trenches of the left attack. His right leg being amputated, his stamina went with it and he expired. He had just been promoted to the rank of corporal for his activity and usefulness in the batteries. At the same attack in the third parallel private Neil Campbell was killed on the 21st May by a round shot, which carried away a portion of his head, while building an abutment on the left of the traversé in No. 14 battery. Private Joseph Finch working by his side, with a bared breast, was hit by a fragment of his comrade's skull, which stuck like an arrow in his neck.

A division of the army sent to the Sea of Azof, under the command of Lieutenant-General Sir George Brown, to reduce the Russian strongholds on the coast, took with it 43 men of the seventh company, who embarked in the 'Bahiana' at Balaklava on the 22nd May and landed at Kimish-Corum in the neighbourhood of Kertch on the 24th. Captain Hassard commanded the sappers, with whom were Captain Stanton and Lieutenants Murray and Drake. Lieutenant-Colonel Gordon directed the engineering arrangements. After assisting the Land Transport corps in landing and removing the stores and horses, in which their services were most useful, they burnt down the bullet manufactory in the suburbs of Kertch; threw up, with the infantry, a line of intrenchments from the sea to the centre of the position, the French constructing the other moiety; demolished several sea batteries commanding the

channel of the Sea of Azof, and made preparations by collecting stores and materials for an attack on Anapa.

On the 23rd, at night, was begun on the right attack a trench along the track which interposed between our right and the French Inkermann left. The old arm which some time before had been made to grasp the works of the allies, was now enfiladed from the Russian trenches in front of the Mamelon, and many men having been picked off by musketry in passing, it was regarded as too unsafe for future use. The work was divided into two portions. Eight sappers were allotted to the first, and one hundred of the infantry, with eight other sappers, to the second. It was a very exposed quarter, and the men selected to take the lead, accustomed to foremost duty, knew well how to force the work with the least amount of danger. The excavations were pushed on rapidly, re-using from the old communication the gabions which revetted it. A field-piece from the enemy constantly fired on the party, without, however, interrupting the work or occasioning any casualty.

Next night eight fresh sappers and one hundred linesmen were distributed in the communication, who were exposed to so harassing a fire from the Mamelon and other batteries, that Lieutenant James of the engineers had some difficulty in inducing the working party to go on steadily. The sappers, however, urged a-head, dropping gabion after gabion, checked ever and anon by an excess of fire, which caused them to stoop for shelter under the securer parapet. In about an hour, the workmen becoming cool, they handled their tools with unexpected earnestness. Sixty-three gabions—all that were brought from the abandoned parallel—were staked. Thirty-eight of them were filled, for which distance tolerable cover was thrown up. Great as was the cannonading it was singularly harmless; but just as the party were about to leave the trenches, a shell from a howitzer mounted in the works at the left of the round tower, fell into the communication, killing private Richard Walsh and wounding private George Wood and another sapper, as also two of the workmen. Each succeeding relief gave itself to the work with activity, preserving the strictest

discipline. Rock had often to be removed to deepen and widen the trench, and it required at times more than usual caution and judgment in placing the gabions. Seldom were fewer than sixty fixed in prolongation of the work, but as this was always done by the flying method, the sappers were necessarily exposed during the whole distance. In returning from the head of the work, it was not an uncommon occurrence to find several of the gabions thrown down by projectiles from the Mamelon. Here, then, was the greatest danger, but not less expert than resolute, the capsized baskets were speedily reset by the overseers and adjusted to the trace. So went on the trench till the night of the 28th May, when the sappers, with admirable coolness, running along the remaining trace planted sixty-six gabions. The last gabion entered a cutting through the old international communication—a part of it free from enfilade fire. It was thus embodied with the new work and that night the confederate parallel was re-established.

On the 24th was commenced No. 15 battery on the right attack for three mortars, by a brigade of sappers and 100 men. It was traced on the crest of the Woronzoff ravine among some quarries, by Lieutenant James of the engineers, 50 feet of which offered a natural revetment. The remainder of the trace was marked by a lodgment of fifteen gabions. Good work was performed though the site was rocky, and before daylight the parapet was well risen. Heaps of stones, which were contiguous, were built into it and both epaulments. Vigilant as was the enemy, he did not discover the battery and it proceeded that night without molestation. By the 2nd June it was ready to join issue in the struggle. It was a solid construction; the communication to it, through an indurated soil, was very strong; and situated on the extreme left of the second parallel, it was the only battery which, for a while, watched the road and ravine. It, moreover, fired into the Redan.

In numbers 7 and 8 batteries on the left, mantlets of tarred cordage were suspended across the necks of the embrasures to mask them from the enemy. This was, apparently, the first time of their employment in the British batteries. Simple as

they were, they fulfilled the object of their use. Each of the mats had a narrow cut at the bottom to allow the gun to run out and also a small opening for the artillerymen to take aim. Where all is rough and dependent in some measure upon experience acquired in hazardous situations, and the quick adaptation of the commonest means to different ends, the application of the rope mantlets was forcibly in keeping with the grim and rugged character of the trenches.

One of the hospital caves was in No. 7 battery which had been deepened and widened by the miners' art into a chamber of approved dimensions. Other huts there were in the trenches in no case exceeding seven feet in height, but the capacity of one or more gave measurements of six by fifteen feet. They were built after the fashion of magazines, but so arranged as to admit more light for the surgeons on duty to carry out those primary remedies which the injuries of the wounded imperatively demanded.

Major-General Jones reviewed the corps in the Crimea on the 25th May. Seven companies passed under his inspection. One, at the time, was with the Kertch expedition. Thinned by the casualty of war, sickness, death, and invalids, the sapper force then paraded, scarcely exceeded 400 bayonets. The major-general's impressions of the inspection and his opinion of the services and character of the sappers were eulogized in a report to Sir John Burgoyne. "It affords me," writes the general, "great pleasure to be enabled to state, that the appearance of the men was most satisfactory, and more so than might have been expected after the severe trials they had to undergo during the severity of the winter, and their constant and very laborious duties in the trenches since October last, and which they have performed with a zeal and readiness which reflects the highest credit upon them. Their conduct has, with few exceptions, been exemplary. The officers attached to the several companies evince a strong desire to have them in the best state of efficiency, and pay the greatest attention to the interior economy, &c. It is surprising that the discipline of the companies should be so good as it is, considering the disadvantages the

men labour under from the frequent change of officers attached to them. The eleventh company has had seven commanding officers within a few months.

"No medals," concludes the general, "have been sent out for the royal sappers and miners for distinguished conduct. The strength of the corps serving with the army is equal to any regiment of the line, and, therefore, the sappers and miners should be considered entitled to the same number, at least, as have been sent out for a regiment; and by the conduct of so many men who have distinguished themselves, there will not be any difficulty of finding men entitled to them under the terms of the royal warrant."

A French officer of high rank who had served before Sebastopol and possessed opportunities of studying the organization and soldierly attributes of the British army, communicated his opinions of the service to a brother officer at Paris. Publicity was given to his views in a free translation by a retired British officer in the 'Daily News.' That concerning the engineers and sappers appeared in its columns—strangely enough—on the very day the inspection just noticed was made, and forms an apposite counterpart to the handsome acknowledgment of Major-General Jones. "I will begin," says the writer, "with the English engineers, a corps which, from what I have seen of its working, can never have been excelled and seldom equalled in any army in the world. The education of the officers, the training and intelligence of the men, the activity of the whole corps, and the manner in which they carry on their works, are fully equal to the same qualifications in our own regiments of engineers. Of the courage of these troops I need not speak—they are like the rest of the English, brave almost to a fault. If ever there was a corps of which a nation should be proud it is that of the English engineers, or sappers and miners as the men are called, whilst the regiment itself and the officers are called the royal engineers."

On the 31st at night the sappers on the right were thus dispersed. Eight in No. 15 battery; six in the 21-gun battery taking down one of the naval magazines injured by a shell burst-

ing on it; and four in the new right boyau. After the working party had left the trenches, the sappers, sent in advance to the right rifle pit, restored before day-break, the parapet which had been thrown down by the fire of the enemy, and also effected indispensable repairs in the communication leading to the field-gun emplacement.

Between the 24th and 31st only one casualty had occurred—private George Clubb wounded in the right hand by a round shot when repairing an embrasure.

June, the ninth month of the siege, had arrived, but the end of the struggle was still distant. Many a hard day's work and many a furious fight was in store for the antagonists. Difficult and harassing as was the enterprise and frightful the carnage that month after month had occurred, there was no ground for the confederates to be dismayed, no reason for lessening that ardour, which, if steadily persevered in, was sure to win the game.

As the works were spreading, it was clear that to carry them on with expedition and success a reinforcement of sappers was essential. Appeals, not without anxiety, were made for them, which were met by efforts of corresponding solicitude. The ninth company, almost reorganized, sailed from Liverpool in the 'Resolute' steamer on the 9th May and landed at Bala-klava, 118 bayonets strong, on the 4th June. Captain Dawson, of the engineers, commanded it. Several men were in it who had served through the Kaffir war and were present in that murderous razzia which swept off half the detachment in the Konap Pass. The kind of warfare suited to contend with a barbaric race and to which they had been accustomed, was ill adapted for the scientific and open field hostilities practised by civilized nations. The sapping attainments, therefore, of the company fell short for a time of the requirements of the siege. Added to the right attack it passed a day or two in camp and then defiled into the trenches.

Considerable advancement had been made in the British works, in which an average of about sixty sappers for the day duties and forty for the night accompanied the several reliefs to

the trenches. On the 1st while laying gabions in the left advance sap on the right attack private John Wright was killed by the explosion of a shell. A magazine in the 21-gun battery being damaged by the enemy's fire six zealous men were turned into it to render it serviceable. This they achieved in the open day amid the bursting of shells; and the powder was replaced before nightfall. A couple of sappers also assisted to make good the repairs to the picket-house battery; others improved the tub revetment round the shaft of the ammunition caves; others fixed additional chevaux-de-frise across the Woronzoff road to block up the ravine; and a moving force repaired by night the breaches which daily were made in the various batteries. These were cleared of broken gabions, shattered bags and loose earth, and the embrasures were again finished with visages so stern and solid they seemed as if no harm had ever befallen them. Nos. 12, 13, and 14 batteries were hourly growing into the required stature. No. 12 was on the curve of the second parallel at a point from whence issued a rocky communication to No. 11. Nos. 13 and 14, with No. 8 between, were situated on the crescent of the third parallel, and communicated with No. 15 on the right and 7 on the left. The circuitous trench or fourth parallel was strengthened in parts by a double gabionade, and everywhere the sappers and line miners were blasting the rock to obtain stones for cover. On the 5th at night a solitary sapper mounted the roof of the magazine in No. 14 battery on the right attack, cleared away some superabundant earth, and after he had completed the service proceeded to one more dangerous. It was the right rifle pit in advance of the third parallel. The parapet had only just been thrown down by a round shot and wounded a man. The next shot might have wounded him, for the screen was accurately in range, but no consideration was so paramount as the execution at all hazards of a necessary restoration. Warily, and by degrees, he filled up the gap while the fire was upon him, and before day-break finished his fatiguing task.

It was arranged among the generals to make another assault preceded by an uninterrupted cannonade of some hours' du-

ration. Accordingly at three o'clock on the afternoon of the 6th began the third bombardment. The French opened with a crashing array of ordnance, and the British had 158 pieces of artillery in vigorous play, to which the Russians replied from more powerful armaments in the Mamelon, Redan, the barrack and upper garden batteries, and those also from the town and creek. Admirably was the fire maintained. Projectiles of every weight crossed in showers, but so dense was the smoke—resting like storm-clouds on the terrible scene—that neither side could take better aim than what the flashes of the guns afforded. At dusk the cannonading waned on both sides, at which time the enemy confined his demonstration to a few guns only. All the Russian works were much injured, the batteries broken up, and parapets and embrasures, in part, demolished. Those of the British, on the contrary, presented effects so disproportionate as to make the contrast between them and those of the besieged almost marvellous. Nos. 9 and 14, two contiguous batteries, seated on the swell of the second parallel on the right attack, however, fared less fortunately than the rest: they were knocked into strange shapes and three of their guns were disabled. Shot and shell flew into them so accurately that the revetments fell as if shaken by an earthquake into hopeless ruins. All else stood nobly up, escaping with only trivial injuries, which a little sagacity and expertness in the sappers soon made sound and efficient.

There were told off for the batteries and trenches this day twenty-eight sappers for the right attack and sixty-one for the left, who gave attention to the damages as they occurred, and also in blowing up the rock in the new advanced trenches. Even while the bombardment was at its highest the miners were busy in the approaches to the fourth parallel, turning with tedious process the jumper in the rock, loading the holes which had been sufficiently deepened, and firing them one after another in open day. Eight other sappers were employed in rebuilding the electric telegraph station in one of the dismal caves on the right attack. All the men behaved with steadiness in their several duties, and some showed so much confidence and

daring in re-forming the shattered embrasures, despite the firing, that their names were brought to the notice of Lord Raglan. These were corporal Joseph J. Stanton, second corporal Samuel Cole, and private Alexander McCaughey, to whom was presented by his lordship's order, a donation of two pounds each in acknowledgment of their gallantry; and subsequently each was honoured with the badge of a silver medal for "distinguished service in the field," accompanied by gratuities of ten pounds each to the two former and five to the last.¹

Corporal Stanton had to look after the batteries of the second parallel on the right attack, having under him a small party of the Buffs and two sappers of the ninth company, none of whom had been in the trenches before. His superintendence was therefore irksome and laborious. By his steadfastness and the vigour of his actions, he gradually dissipated their hesitation, and following where he led, they assisted to remove obstructions from the embrasures, particularly the broken hide mantlets stuffed with wool, which, with their fastenings, had dropped across the openings and choked up the gorges. Moving from battery to battery, Stanton was repeatedly in the embrasures and even where the mantlets were sound, cut them down with a strong arm—for he was a powerful man—as the advantage of their retention as shields was far outweighed by the terrible hazards of clearing them away should they fall in the embrasures. While these deeds were in progress, showers of grape and groups of shot and shell poured into the batteries causing accidents of a very singular character. A shell came over into No. 13 battery, and striking another shell which was being loaded, an explosion took place wounding the captain and the serjeant of artillery engaged in the service. The right gun of the battery had become useless from one of its trunnions breaking; and so to prevent unnecessary casualty one of the sappers filled up the neck of the embrasure with a mask of sand-bags. While so employed a shot just passed

¹ Gunner Burke, of the royal artillery, also assisted in repairing an embrasure under the heaviest fire in No. 14 battery of the right attack, and Lord Raglan rewarded him, like the sappers, with a present of two sovereigns.

over his head and entered the disabled gun sticking fast in the muzzle. Narrowly, on two occasions, he escaped during the day, but his comrade was severely wounded in the head by the bursting of a 10-inch shell.

Among the troops the casualties were considerable, but in the sappers three only were wounded :—

Colour-sergeant Alexander M. McLeod—slightly, in the head, by a shell splinter.

Private John Peterson—slightly, in the face and head, while blasting.

„ John Patterson—severely.

For the two attacks there were fifty sappers provided at dusk to shore up the works and mend the breaches in the parapets during the night. Some of the troops who occupied a dangerous post in front to guard the trenches fell asleep, and thus failed to fire into the embrasures of the Redan. This arose from a misconception of orders. It is worthy of record, nevertheless, to show how cool were those brave men who, only a bow-shot from danger, as if in undisturbed possession of an English barrack-room and unaffected by care, reposed on the banquettes. The working party on the right attack in No. 9 battery evinced great want of spirit in the measures necessary to repair it. A ruinous fire had broken it up and knocked down its embrasures. Much exertion was needed to make it equal to the struggle, and the party quitted at the time for relief, without having made that progress which it was calculated would result from the number of men appointed to make good the damages. The corporal of sappers in charge of the workmen who was consequently involved in their inactivity, was subjected to the penalty he merited. Lieutenants James and Somerville were the engineers responsible for the restorations on the right, and they had under their orders thirty-two sappers. Half of the number had been taken from the ninth company newly arrived from England. This being their first time in the trenches they scarcely understood their duty in the impromptu way in which war teaches it; but yet, they left the advance that night with approbation. Corporal David Simpson of the ninth company, was conspicuous for his tact and coolness in mending an em-

brasure at grey light in the morning, while shells fell wide of the devoted man who filled up the gap. Lord Raglan awarded him two sovereigns in token of his satisfaction. Throughout the night the cannonading was continued principally by vertical fire and additional damage was done to the works; but, with few exceptions, the injuries were repaired, and all the embrasures supplied with sound gabions and sand-bags before day-break. Even the batteries which kept up their fire were attended to, and the shattered baskets and tubs, and the torn hides and sand-bags, were replaced during the intervals of the several rounds. No time was lost, no exertion withheld, to give an appearance to the general works of freshness and strength. The sapper carpenters repaired the various platforms in the 21-gun battery and the roof of the right magazine of No. 9 battery, which, struck by a shell, was much shaken. Alexander Montgomery, the sergeant in executive charge of the sappers on the right—who had served in many a fight as a military adventurer in maintaining the royal cause both of Portugal and Spain against insurgents ranked on the side of powerful pretenders—was commended by Major-General Jones for his zealous conduct and intelligent assistance to his officers.

A party of sailors thrown into the trenches worked exceedingly well. Indeed, without their help the repairs to the 21-gun battery could not have been completed. The man-o'-war's-man labours in his own way, and does it with so much heartiness that, however singular and incautious may be his modes of proceeding, he achieves his end in time. Five of the seamen were wounded, but none of the sappers, though equally exposed, were hurt.

Just as the sappers were paraded at the engineer hut in the first parallel to return to camp, an artillery officer appeared and represented that the embrasures of No. 11 battery—the only work which raked the picket-house ravine—needed immediate attention. The news was not pleasant to men who had performed a fatiguing night's labour. Feeling the hardship of this extra duty, the engineer officer was disinclined to order any of his sappers to undertake the repairs, and so, calling for volun-

teers, his wishes were instantly met by several willing men offering for the service. Such unhesitating renunciation of themselves was deservedly applauded. Corporal Joseph Lockwood, lance-corporal Samuel Varren, and privates John Jaffray and Charles Carlin, passing from No. 5 by the trench which rounded No. 9, pushed onwards by the continued communication into No. 11, and leaped into the embrasures. In about two hours, with such old materials as they could find, they patched up the shapeless checks in as solid a form as the urgency of the occasion permitted. The repairs were necessarily of a rustic character, for wooden and iron gabions, sandbags, fascines, earth, and loose stones—the available litter of the battery, in fact—were all employed in tinkering the breaches. From the moment the Russians perceived the sappers in the openings, a steady fire of Miniés was maintained against them, and a couple of furious shells burst in their rear; but they passed untouched from the trenches, and their exertions and resource were acknowledged by Major-General Jones in brigade orders.

The works of the adversary which had been uprooted by the fierceness of the besiegers' fire were rebuilt and rearmcd in the night. There were some, however, which seemed to totter on their bases. Wondrous must have been the energy employed to give completeness to such a series of extensive formations as comprised their defences. There was, let it be acknowledged, a Vauban in the fortress. Todleben was he, an ardent and skilful general and engineer, whose genius made him equal to any pressure and capable of compassing any amount of devastation. We, too, had Vaubans, disciples of the most approved military masters; and the solid field structures founded by their talent and directed by their skill and sleepless industry, prove their worthiness to rank with the best engineers of any country. It only wanted this unprecedented siege to make clear that which, for forty years, was an open question.

No working party was furnished for the left attack on the 7th. There were, however, 54 sappers in the trenches who mended the embrasures and threw up the rock by mining in

different places in the third parallel. Private Walter Conning, a delicate man but of robust purpose, was noticed by Major Bent for his calm activity while mending an embrasure in No. 4 battery on the left attack. His duty was to attend to the repairs of the platforms; but as these were in a serviceable state and he did not choose to remain idle, he leaped into an embrasure and assisted his comrades to rebuild it. While doing so he was struck down by a spent shot which knocked him from the aperture against the traverse. This self-imposed employment, an instance of unobtrusive devotion, coupled with his uniform steadiness and zeal in working the advanced trenches, gained for him promotion and the decoration of the Military War Medal of France.

Adam McKechnie—a private—was no less conspicuous in No. 9 battery repairing with sand-bags two embrasures which had been knocked to pieces. A blaze of fire was upon him during the whole time, but he continued his exertions for more than two hours with a bearing so manly, that Lieutenant Oldfield of the royal navy and his seamen, looked on with as much admiration as surprise.

Among those who were the most praised was private Andrew Fairservice. He is stated to have been “exceedingly active in repairing embrasures under heavy fire;” so much so, indeed, that his valour and perseverance gained him the honour of a “distinguished service” medal and a gratuity of five pounds.

For the right attack the numbers detailed—about forty—were told off to their posts by sergeant Donald McFarlane. Captain Dawson of the engineers, the officer on duty, was killed early in the morning in the 21-gun battery. He was the captain of the ninth company and this was his maiden tour in the trenches. In little more than two hours after leaving the camp he was borne back dead, his head having been shattered by a round shot. Incessant repairs to the embrasures and parapets kept the sappers constantly exposed, and they toiled with all the ardour for which they had now become famous.

Some men of the ninth company in the 21-gun battery
FOR IT

were unequal to the hard work of the embrasures, and Captain Peel of the navy urged the necessity of sending some *old sappers*—meaning men who had been at the siege from the commencement—to be allotted to the duty. Second-corporal George H. Collins and a brigade of eight men were at once sent to the front, and so incessant were their labours, they were never clear of the embrasures for five minutes during the ten hours they served in the battery. All day long the sun was hot and burning, the sky clear, and not a man that thrust himself into the shattered apertures could reckon for an instant on his safety. Not a shadow was thrown to conceal him from observation, and he trusted to his agility to escape, when the “look-out man” warning him of approaching shot or shell, gave him the chance of making a desperate leap from the opening.

Most assiduous were the carpenters in strengthening the platforms, for the continued friction of the guns in their heavy and irresistible recoil injured not a few of them. A platform on the right of the 21-gun battery required in haste for an effective piece of ordnance was rapidly refitted; but before the mortar could be shifted on it, a 13-inch shell from a battery in rear of the Redan struck the flooring and broke it in pieces.

In the afternoon, the strongest and most secure magazine on the right attack was blown up. It was on the left of the 8-gun battery. A shell plunged through the roof and bursting, all that remained of the magazine was a smoking ruin. Private John Heaton who was returning to his party after mending a platform at a distance, was killed by the explosion and not an atom of his remains was ever discovered. Privates George Wright and Stephen Gossage were wounded by fragments of the scattered timber. On hearing the report—ominous of loss both of material and life—the Russians jumped on their batteries and parapets, and, intimating their joy at the calamity by a fiendish yell, quickly disappeared behind their revetments.

Wherever the Russians had established screens, they opened communications to them, and then connecting each with the other, so formed a parallel. One of this kind stretched its

length 150 yards in front of the British trenches which was nightly strengthened, widened, and improved. The line, extending from the Mamelon to the Quarries, formed the enemy's exterior defence, beyond which except the rifle-pits he was never able to advance. As the besiegers flung out their boyeaux and breasted them with batteries or filled them with sharp-shooters, the Russians, equally pushing, spent their arts and energies in rendering their works both formidable and inaccessible. This advanced parallel having greatly annoyed the besiegers and laid many a brave section low, a combined attack was determined on,—the French to assault the *Ouvrage Blancs* and the Mamelon; the English, the Quarries and its appended works facing the left of the right attack.

At about six in the evening—just as the sun was setting—the assault was made by half a battalion of infantry from the light and second divisions headed by Lieutenant Lowry of the engineers and a small party of royal sappers and miners. The whole were commanded by Colonel Shirley. Divided into two columns of 200 each, the half battalion dashed on to the flanks of the Quarries, and supported by a reserve of 600 men, fought nobly against odds which threatened to overwhelm them. A tremendous cannonade had swept the Quarries until a few minutes before the encounter, when all the batteries turned their venom on the Russian lines and broke them up one after another. Repelled once, the assailants soon recovered themselves and drove the Russians before them; but, contending against an enemy almost invincible, the stormers again and again were forced back. At this moment, Lieutenant-Colonel Tylden of the engineers, who had a working party of 800 men under his orders, let loose his armed pioneers, and three-fourths of them rushed into the quarries—those impregnable hollows, hemmed in by walls of rock and paved with broken stones and boulders—to share in the contest. This timely help, giving fresh vigour to the assault, the stormers, renewed in spirit, bravely seconded the stern efforts of the reinforcements; and a withering musketry, close and telling, struck down their antagonists to the earth, leaving chasms in their masses which a stream of

troops from the Redan as quickly refilled. Swoop following swoop levelled section after section, succeeded by a temporary wavering which augured a retreat. The quivering, however, passed, and the enemy yet stood in the pits which so long had shielded them and worried the assailants as if the last man intended to die in the ambuscade. Already the immolation showed how desperate was the strife; the Russians at length, were well nigh exhausted; but a few minutes more, and the besiegers, struggling over the debris of old explosions and amid rocky traverses and huge fragments of stone, pressed the enemy's columns at all points and drove them bewildered into the Redan. The Ouvrage Blancs and the Mamelon by this time were gallantly taken by the French.

As soon as the seizure had been accomplished, Lieutenant-Colonel Tylden moved up from the right-ravine communication his working party of 200 eager men led by a few sappers with corporal Joseph J. Stanton. There was no confusion; no complexity of detail; and at once, under Lieutenant Elphinstone of the engineers, the lodgment was commenced, while the zigzag from the quarries, to connect with the left advanced sap adjoining Egerton's rifle-pits, was opened under Captain Wolseley of the 90th regiment, assistant engineer. Every nerve was strained to perfect the works before morning; the trenches were quickly reversed; and the earth and stones belonging to the old revetment were built into the new parapet which was faced with gabions, 200 of which, all that were brought in by the working party, were laid by Lieutenant Elphinstone, corporal Stanton, and the sappers. Bold efforts were ineffectually made by the Russians to regain their loss, even carrying away, in their desperate prowess, some of the lumbering gabions; but the victors, indisposed to yield an inch, retook the baskets and held the ambuscade with intrepid tenacity, while the working party, saved by the vigilance of the stormers from material interruption in their exertions succeeded, before the arrival of the new relief, in giving to the lodgment and communication sufficient cover for immediate defence. All this being effected in a dark night, with thick

dangers around, was creditable to the endurance and industry of the officers who directed and the soldiers who toiled. Captain Browne of the engineers had the general superintendence of the works under Colonel Tylden.

Lieutenant Lowry, a young officer, led the storming party most gallantly and was killed while rallying the men after having been repulsed. He was carried away by some sappers, who, working on the parapet of the quarries saw him fall. His sword was delivered to corporal Stanton, of which he made good use. A Russian was outside, behind a gabion, bent on his knee. Observed while in the act of levelling his musket, Stanton waved the sword, and with one blow struck him down. Lieutenant Elphinstone and corporal Stanton were working side by side at the time, but the former was unaware of his danger till the deadly act of the latter had removed the cause.

Lieutenant Anderson of the 96th regiment, assistant engineer, was wounded early in the night. The sappers present in the storming were about 12, divided between the two assaulting columns; 40 were with the reserve battalion and the working party, and other brigades were distributed to the batteries. The casualties among the parties were eight wounded:—

Second-corporal Peter Luxton—severely, in the head, by grape-shot.

Private William McDonald—dangerously, by fracture of skull, from gun-shot.
He died of his wounds.

„ William R. Collings—dangerously, in left leg, by rifle-ball. He had crept up the open and was in the act of stretching the tape by which to place the line of gabions to connect the zigzag from the quarries to the left advanced approach, when the ball entered below the swell of his leg and issued at the knee. He died of his wounds.

Lance-corporal Robert Young—severely, in the right arm, in Greenhill battery.
Private Walter Conning—slightly, in the hip.

„ Samuel Dines—slightly, in the head, by a rifle ball, while entering an embrasure of the 21-gun battery.

„ Alexander Hosie—severely, in the throat, by splinter of a shell, while in the 21-gun battery.

„ Peter Slade—severely, in the head, in No. 9 battery, left attack.

“Notwithstanding,” wrote Lord Raglan, under date the 9th June, “the frequency of the endeavours of the Russians to

regain possession of the quarries, and the interruptions to the work to which these attacks gave rise, Lieutenant-Colonel Tylden was enabled to effect the lodgment, and to establish the communication with the advanced parallel; and this redounds greatly to his credit and that of the officers and men employed as the working party; and I cannot omit this opportunity to express my approbation of the conduct of the sappers throughout the operations."

With remarkable skill the quarries had been entrenched by the Russians and novel schemes adopted to render them successful against an assault. About twenty yards in front of the works there were hidden dangers intended to throw advancing columns into hopeless confusion. It was well that the troops had no knowledge of their presence or they might have shrunk from an attack which yielded them such important advantages. Entering the quarries by the flanks, they were preserved from calamities that awaited them had they made the attack direct. Cubical boxes, filled with gunpowder, were buried in the ground with glass tubes attached to them containing an explosive composition. Delicately adjusted, though roughly constructed, these infernal machines only required the tread of hasty feet to produce combustion and blow up the stormers. Luckily, no accident occurred during the attack; and although forty or more of the boxes had subsequently been extracted from the soil, only two or three, bursting by pressure, occasioned any accident.

1855.

8th June—18th June.

SIEGE OF SEBASTOPOL.

Repairs to the works—Death of corporal Fraser—Conduct of private Orr—Improvised church—Perseverance in the quarries—Segmental trench in front of them—Successful exertions of the miners—Yenikale—Cape St. Paul—Detail of sappers furnished for the trenches—Completion of defences in the lodgment—Casualties in a party mending a trench bridge—State of the works—Platforms—What is an embrasure?—Destruction of one—Its repair—Casualties—A tolerated grumbler—Generous conduct of corporal Lockwood—Fourth bombardment; preparations for assault—Vigorous conduct of sergeant Anderson in repairing the electric wires And of corporal Borbidge in renewing a platform for a sea-service mortar—First storming of the Redan—Chivalric behaviour of private Head—Casualties—Conduct of the sappers in the assault—Volunteer services of sergeant Drew and corporal Jenkins—They rescue some of the wounded—So also does private Ramsay—Brigadier-General Eyre's column in the cemetery grounds—Valiant behaviour of corporal Baker—General casualties—Death of Lord Raglan.

No time was lost in making the most of the position won by the gallantry of the besiegers; but on the 8th June, owing to the exhausted state of the troops from the labours of the previous night, no working party could be provided for the right attack. Fifty-two sappers, however, took their places as usual in the lines, repairing embrasures, improving the cover of the quarries, and deepening the communications to them. To preserve their energies, they were employed in four reliefs of four hours each throughout the day. Very heavy was the firing from the Russian batteries during the first relief, occasioning many casualties among the guard of the trenches and harassing though not interrupting the workmen. On the left there were 150 linesmen and 38 sappers scattered over the trenches,

restoring demolished embrasures and parapets, and re-roofing magazines torn up by shells.

While thus employed in No. 10 battery situated on a central projection of the second parallel, second-corporal James Fraser—a fearless young non-commissioned officer—was killed. Fraser was working in an embrasure—a mere crag, so complete was its disruption—patching up the left cheek with sand-bags, while corporal McEachern was reconstructing the right one. The firing on the battery was very fierce, but the two corporals, stript to their trousers and shirts, toiled away with dauntless perseverance. “Never mind the rascals,” said Fraser, with an encouraging smile, “we’ll finish it in spite of them.” Such was his determination; but a few moments after, he was blown from the embrasure by a round shot, which carried away his right arm and the whole of his breast and ribs, exposing his quivering heart. McEachern heard the shot pass and felt the heat which its velocity imparted; and on turning round to see how his comrade had fared, he saw him doubled up on a pile of projectiles and the gunners and workmen gathering up his remains. McEachern had seen too many such catastrophes to slacken his energies, and so resuming the work as if nothing had happened he left it only when the cheeks were finished.

Private John Malcolm, an hour after, was sent into the same embrasure to clear the sole, as the gun in its rear could not be sufficiently depressed to fire with advantage. Stripped to the work, he was shovelling away the debris, when a splinter from a shell struck him severely on the head. At the instant, he fell from the aperture to the platform, and the next moment a shower of fierce stones fell on him, fretting his flannel shirt as if a rasp had torn it up and wounding him in both shoulders.

In the night following there were 59 sappers in the front, who were succeeded next morning by 71 men. Many laboured at the different batteries and privates John Sykes and William Orr, in charge of No. 10 battery, left attack, were named to Lord Raglan as having behaved with conspicuous zeal and coolness in removing the debris of broken gabions and split-

bags from the disfigured embrasures and rebuilding the cheeks. So heavy was the fire at the time, that one gun was disabled in the battery and some of the artillery carriages injured. General Jones was an eye-witness of the manly way in which Orr entered the embrasures between the rounds of fire, and of his unruffled exertions to clear the soles and mend the revetments; and when the general had it in his power to mark, in a substantial manner, his appreciation of the private's intrepid demeanour, he obtained for him a "distinguished service" medal and a gratuity of five pounds.

Before nightfall the lodgment was made completely defensible, and a chevaux-de-frise was fixed, in the shape of a half moon, by a few sapper blacksmiths, some distance in front, to protect the working parties from sudden assaults.

It was about this time that the companies, in the midst of their exertions and trials, eked out sufficient leisure from their camp duties to show their reliance upon that religion which alone could sustain and console them in vicissitude and peril. The *edifice* they erected in which to offer up their devotions was characteristic, and the following account of it, transcribed from the 'Daily News,' gives a fair view of the details of this improvised and unique military cathedral:—

"One among the many interesting objects in the British camp before Sebastopol is the Sappers' church, 'right attack,' where the Rev. Mr. Taylor officiates. Its structure affords an excellent example of the adaptation of local circumstances to a particular object. It is built wholly of siege apparatus; but these are neither injured nor rendered unfit for their ultimate purpose; on the contrary, the materials are so arranged that they are only in store, as it were, ready for use as soon as required. The articles employed in the construction have been scaling-ladders, gabions, fascines, timbers ready cut and shaped for gun-platforms, a few planks, and some pieces of rope. Two scaling-ladders locked into each other at the top, so as to give and derive mutual support, form, at certain intervals, the columns which separate the aisles from the body of the church, and bear the roof. The framework of the outer wall is made

by long upright timbers, which lean against the summits of each set of ladders respectively, and are secured by cords. Across these a few joist-beams are lashed, and the outer wall of gabions, though thicker at the base than above, in a great degree rest against these horizontal supports. To form the wall the gabions are placed end to end, one above the other, until they reach the height of the roof. Nothing can be more agreeable, during the heat of the day, than the sensation produced by the air entering through this gauge-work of twigs; it passes freely, but is so sprinkled, as it were, in its passage—its force is so broken, that, however strong without, it fails to cause any unpleasant disturbance within. The sun's light is broken with an equally pleasing effect, for the rays which find their way in are so refracted and disturbed, that all glare and dazzle are prevented. The roof is made by the platform timbers laid between the tops of the ladders on each side, and at right angles to these the fascines are laid in regular rows, until a complete covering is formed. The roof is light, admits of course of free ventilation, and gives a perfect protection against the direct rays of the sun. At the end opposite the entrance into this truly military church, a semicircular sweep is given to the gabion wall, and in the recess thus formed several sacks stuffed with straw are arranged, to form a reading-desk and kneeling-cushion for the preacher. Planks are laid on each side from ladder to ladder, resting at a convenient height on the lower rails, and these benches are appropriated for the use of the weak and convalescents from the hospital; the other soldiers stand during the service.

“When the Union-Jack has been thrown over the primitive reading-desk above mentioned, and the clergyman is in his usual robes, and the engineers and sappers are filling the space in their military costume, all seems so appropriate and in such harmony, that should a visitor be among the number of the congregation, he soon ceases to feel the peculiarity of the place, and forgets, while engaged in the service, that he is not in one of the ordinary churches, with its stoned walls and steepled roof, in his own mother-country. Now and then the attention of ‘e

listener to the 'mission of peace and good-will among men' may be distracted for a moment by the heavy thunder of a gun, or the bursting of a shell; for the Sappers' church is on one side of the ravine leading to Careening Bay, and since the Russian redoubts and French works have been established on the heights above, such sounds have become frequent on all days, and at all hours of the work. But the sappers themselves know that their yard is out of range, though only just out of it, and habit in this, as in other matters, produces its usual effect. The gun is discharged, the shot whizzes through the air, and the shell explodes; but the sounds, if heard, are not heeded, for the attention is otherwise occupied."

By the 10th June, on which date there were 94 sappers in the front, the batteries were all in admirable order, another screen overlooking the Woronzoff road was finished, and the lodgment and its communications looked grim with details which promised to be formidable when completed. On that day, fifty men of the line had been thrown into the quarries to assist in converting them to the besiegers' will; but after a while, so accurate and fierce was the fire upon them from a mortar and a gun on the right of the tower, that the party was necessarily withdrawn. "Whistling Dick," from the mortar alluded to, was doing its best to thin the workmen; but luckily its terrific presence was unaccompanied by any serious disaster. Still the sappers, twelve in number, were retained at this dangerous spot; and working away amid descending shells bursting in all directions and splinters driving even into obscure angles, they strengthened the parapet by building stones into the revetment, made loopholes, and continued the formation of the banquette. At three o'clock in the afternoon, Captain Browne of the engineers, persevering in his endeavours to work the lodgment, sent other fifty men into it who laboured in the quarries till regularly relieved. More than fifty casualties occurred in and about the quarries during the day; among these was private William Lang who was dangerously wounded by a shell which carried away his arm. A group of his comrades, who were near at the time, threw themselves down to

avoid its splinters. Awful moments followed, each expecting, but hoping to escape the death that seemed inevitable. Fortunately the shell buried itself in the earth, then fizzed in paroxysms for a few seconds, when, grinding further into the soil, the fuze providentially was smothered. Another sapper, name unknown, was wounded in the left attack.

Seventy men of the corps were in the trenches during the night of the 10th scattered over the works of the two attacks. The lodgment, still offering occasion for anxious solicitude, progressed with energy and a new trench was formed on a segmental trace in front of the quarries, taking the captured ambushade as the base of the figure. The spring of the bow issued from the right of the lodgment, then, bending away in an arch, abutted on the left of the quarries. The trench was clear of the salient of the Redan, but intersected the Malakoff abattis at a point where a gap had recently been made by a round shot from the besiegers. All the gabions, 180 in number, which lined the excavation, were staked and filled before the morning. Not a shot or bullet came in the direction during its progress. Twelve sappers were appointed to this new trench, who, receiving the gabions from the line, placed them on the sweep of the curve with a rapidity and sprightliness so marked, it seemed as if the men were chasing each other to the goal. The workmen were chiefly of the 19th regiment, by whom, and a party from the light division, about 180 in all, the gabions were filled.

Next day there were 103 sappers in the lines, and 74 at night. At daybreak on the 12th, there were 81 men in the front. Considerable exertions had been made in mining on the left attack, principally in the round-hill parallel, where, stopped by rock at every step, not a move could be made ahead, till by great bodily exertion, and patient coolness against inevitable personal risks, the obstruction was blown away. Laborious and fatiguing as were these duties, they were executed with no abatement of care; and it may be mentioned that from the first, out of thousands of blasts fired successfully throughout the works, and many more which failed in critical situations, only

two accidents by mining had occurred. A more striking proof of the proficiency of the men need scarcely be adduced. The sufferers were private John Stancombe who lost the sight of one of his eyes, and lance-corporal William Eastley who was severely wounded by a stone of about 14 pounds weight striking him in the back. The former was blown up, and receiving the blast full in his face, blood poured from a hundred punctures, and when the wounds were healed, his skin was thickly speckled with blue marks as if elaborately tattooed by some unskilful mariner.

Leaving a party of fourteen rank and file at Yenikale, the remainder of the company with Sir George Brown's expedition re-embarked on the 11th June under Captain Hassard and landed at Balaklava on the 14th. Lieutenant Anderson was located at Yenikale with six sappers, and Captain Stanton and Lieutenant Drake proceeded with the rest to Cape St. Paul. The works to defend these captured positions were commenced respectively on the 15th and 18th June, the French superintending one portion, the English the other, both assisted by strong parties of Turks, sometimes as many as a thousand a-day at each fort. At Yenikale some old houses were pulled down which furnished timber for the works, and when this source failed, planking and nails were obtained from some stranded vessels in the channel. The lines consisted of a cordon of trenches with a strong lunette in rear and a series of rifle-pits in front. The stockades, platforms, and the folding loopholed gates of the lunette were chiefly executed by the sappers, who, after the 14th July, worked in concert with the French in continuing the covered way on the right to the sea. On the 4th August, Lieutenant Anderson and his sappers reappeared in the trenches before Sebastopol.

At Cape St. Paul the intrenchments, extending more than a thousand yards inland, abutted on bold precipices overhanging the sea. Following the contour of a broken country, the knolls embraced in the lines became so many salients armed with one or more field-pieces. Strong works were thrown up in advance of the main trenches to flank them, and rifle-screens were con-

structed on eminences to command access to the wells, which, situated about 1200 yards in front of the works, were open to hostile interference. The hard nature of the soil in some places prevented the digging of ditches, and to counteract the defect, escarpments were erected about 12 feet high. A considerable portion of the redoubt at the extreme inland angle of the trenches was built with rough stones, faced by hewn blocks of a softer kind, accumulations of which were found already dressed and fit for use. Around St. George's Hill huge boulders encumbered the trenches, which in time were borne up by manual strength and built into the parapets. Thunderstorms frequently occurring, the rains beat down portions of the earthen cover, which were renewed, though at great labour, with less yielding expedients. A mamelon, too, was wholly cut away to insure completeness in the defences, and the isolated battery on the promontory of Akbornou, standing up with a cold and truculent aspect, was levelled to the rock out of which it sprang. At that point was thrown up a bastioned trench by the 71st regiment to protect the right of the position. The sappers, eight in all, first under Captain Stanton, then Lieutenant Drake, superintended the construction of the several works, and returned to Sebastopol in the middle of December. Corporal McKimm and lance-corporal R. Crawford Cowan, two excellent sappers both of whom had been named with honour for their gallantry at the siege, were with the party.

At night on the 12th, Lieutenants Elphinstone and Graham traced the first portion of the fifth parallel facing the right flank of the Redan. They had with them second corporal George H. Collins and private Moncur, two smart and reliable sappers, to whom the executive superintendence of the work was intrusted. After completing the trace, 7 other sappers and 120 of the line commenced a boyau from the most advanced trench in front of the quarries. Fifty-six gabions were laid and filled in this approach, and then the sappers run along the new parallel with fifty other gabions, placing ten more at the extremity of the series, with a short obtuse angle backwards, to screen the line-men while filling the baskets and forming the

parapet of the new work. Alarms twice occurred which caused the workmen to retire. Collins, indisposed to yield to a questionable danger, went some distance to the front to ascertain if there existed any reason for it; but seeing nothing to justify the retreat, he encouraged the men to return and they readily resumed work. The relief had been in the trench some time when the second interruption took place. Again Collins restored confidence by mounting the parapet and there remaining till the ill-founded fears of the linesmen had subsided. Both parties, nevertheless, worked very well and obtained excellent cover. The sappers were on duty at this new sap for seventeen hours without relief.

The following detail shows the force of sappers furnished by night and day for front duty during the period comprised in the table. Ever-varying circumstances caused the number to fluctuate, so that with each party it was hardly possible to afford a stronger contingent of overseers than was marched at day-break and at dusk into the trenches :—

		Attacks.	No of Men.	Officers on Duty.
Night	12th June	Right	48	Lieuts. Elphinstone and Graham.
		Left	33	Capt. Belson and Lieut. Donnelly.
Day	13th "	Right	40	Capt. Browne and Lieut. Darrah.
		Left	63	Major Chapman, 20th regt., assist. eng.
Night	13th "	Right	40	Lieut. Fisher.
		Left	32	Captain Jesse and Lieut. Neville.
Day	14th "	Right	44	Lieuts. James and Somerville.
		Left	65	Capt. Penn, R.A., assistant engineer.
Night	14th "	Right	40	Capt. De Moleyns and Capt. Wolseley, 90th, assistant engineer.
		Left	36	Capt. Armit and Lieut. C. G. Gordon.
Day	15th "	Right	40	Lieuts. Graves and Graham.
		Left	49	Lieut. Donnelly.
Night	15th "	Right	40	Capt. Browne and Lieut. Darrah.
		Left	34	Capt. Belson and Major Chapman, 20th.
Day	16th "	Right	40	Lieut. Elphinstone and Major Campbell, 46th, assistant engineer.
		Left	42	Lieut. Neville.
Night	16th "	Right	40	Lieuts. Murray and Fisher.
		Left	35	Capt. Jesse and Capt. Penn, R.A.
Day	17th "	Right	{ 32	Lieuts. Murray and Fisher.
			{ 44	Lieuts. James and Somerville.
		Left	" "	Lieut. C. G. Gordon

			Attacks.	No. of Men.	Officers on duty.
Night	17th	,,	Right	12	Capt. Wolseley, 90th, assist. engineer.
			Left	23	Capt. Armit.
Day	18th	,,	Right	20	Capt. De Moleyns.
			Left	24	Capt. Armit and Lieut. Jones, 46th, assistant engineer.

During these few days, as an assault was in contemplation, the line workmen were active and pushing. Rather strong parties of sappers superintended them, who also cut and formed the embrasures, and took the lead in the new trenches where the skill of craftsmen was indispensable. The lodgment was now wholly completed, communications to it were perfected, and a boyau, issuing from the left of the quarries, had been thrown up with almost daring impertinence for about 120 yards towards the Redan. The gabions were lodged by some sappers in so ready and firm a manner it seemed as if they possessed a genius for such enterprises. Far from being reckless, they advanced, though diligently and coolly, by prudential efforts; and thus effected, so to speak, their own deliverance; while the line, less calculating the danger of their work and less of course accustomed to it, were struck down in rather serious numbers. A new battery, No. 16, for three 32-pounders, and one for four mortars, No. 17, also rose up in the vicinity of the lodgment. Rapidly they were completed with magazines, platforms, and traverses, and the guns and mortars, drawn at night to their positions by the track from Egerton's rifle-pit, were promptly placed on their beds, armed with gunners, and worked with more or less fury as occasion served against the enemy. When all was done the half-moon chevaux-de-frise of spikes was withdrawn from the front and piled up in the lodgment.

On one of these nights ten men of the infantry under a sapper were sent to repair a bridge over which the ammunition was usually conveyed to the batteries in the third parallel. The bridge spanned the fourth boyau a little in rear of No. 13 battery of the left attack. Sergeant Drew set the men to work; but as the shelling was warm on the spot the party asked to be removed. It was of some moment to repair the smashed timbers, and the sergeant urging the men by an appeal to their

courage to resume the work, said he would visit them again in ten minutes. He reappeared within the time appointed, but the whole party had decamped. Going in quest of them, he found that two of the men had been severely wounded, and the rest were carrying them on stretchers to the rear.

Looking abroad on the works which now spread over many miles of ground, meshed by cross-trenches in all directions, it was obvious that *nothing had been omitted which it was in the nature of foresight, resource, or exertion to have executed.* In every battery the revetments had been strengthened or rebuilt; the gabionades improved or restored, and cheeks, merlons, traverses, magazines, and every imaginable desiderata attended to with spirited pertinacity. The usual expedients for field constructions had long since begun to fail, but now their deficiency was largely felt. Still never at a loss for schemes, the engineers applied all sorts of agencies, regarding nothing as crude or trivial, to perform in emergencies effectual parts in the great siege. Iron and wooden hurdles, powder-boxes and ammunition-cases, were thus pressed into the service to do the work and stand the wear of better contrivances. Frequently molested by riflemen and shelled from the batteries, the sappers and pioneers held their posts with unflinching constancy, and each succeeding night saw the restoration of the day's havoc. Even in the glaring sunlight the most essential repairs were executed, while shot and shell were dropping around and Minié bullets were pinging over the parapets and thugging into the slopes. A rifle-screen on the right attack was erected in one night on the very edge of the cliff to sweep the ravine, which harboured in its cavities the Russian sharpshooters. It was difficult of access, but to lessen the danger of reaching it, a species of approach was formed to protect the light troops while driving into the pit. Ten men of the line prepared the screen superintended by a sapper. The 21-gun battery, as of old, received material help to make vigorous and solid its vast proportions and to mend its long inventory of damages. It was the head-quarters for the right-attack, from whence the working parties, guided by the sappers, filed off to their appointed

duties. The batteries on Greenhill, the picket-house, and those in the foremost parallels, were also attended to with equal promptitude and maintained in a state remarkably efficient.

None laid the platforms or built the magazines, splinter-proofs, &c., but the sappers. Everything, indeed, which came under the denomination of artificers' work, was executed by them. The fixing of platforms was only second in importance, as far as hazard was concerned, to the formation of the embrasures. Repeatedly the carpenters were called upon in broad daylight to render them serviceable. Relaying sprung sleepers or planks, and renewing rickets or bolts broken by the violence of the fire or a tearing recoil, were frequently attended to whilst the siege was at its highest; and the only protection which the carpenters received under such circumstances was the scanty cover of a shallow *genouillère*, with perhaps a sapper or two in the gorge busy mending the cheeks of a shivered embrasure. In former sieges the laying of a platform under fire was held to be an act of great personal daring; but in this wonderful enterprise, it was so much a habit of the sappers to see to this particular detail, that it passed among occurrences as a common matter.

What is an embrasure? So much has been said about it, it needs the question; and the answer may not be misplaced here. Look at one while the battle rages. It is a formal cut in a mound of earth, taking the shape of a wedge, with the broad end to the enemy, the narrow to the platform. The narrow end is called "the neck," and possesses just width enough to admit a man or the muzzle of a gun. It then extends to the front for more than twenty feet with a widening orifice, ten or twelve feet broad at the greatest expansion, which is designated "the mouth."

Bold men stand in rear of the opening and equally bold are they who work. With some certainty the range is known and but few shots or shells miss their mark. A ball of weighty metal strikes the embrasure, and makes a crevice to its centre, scattering the sand as in a *sirocco*. Another comes and gashes a well-formed cheek, blows away an ancle or a shoulder, and

topples into the space below, broken hide-bags from the crest and the earth that covers them. The concussion of our own guns assists to loosen the work and the hot fire of the artillerymen dries up the gabions rendering them less susceptible of resistance. These, ere long, woven with so much compactness, are broken up and strewn as in a wood-yard, and fascines unband and yield their bundles to choke up the gorge. One slope after another loses form and splay, fissures appear, stones rock and fall, and the structure totters on a few fragments. Still it bravely holds up in its ruggedness against a storm of fire. Another well-directed shell is delivered and its splinters knock everything to pieces. The feeble props at length are torn away, and all above, like an avalanche, slides upon the sole, which heaving with its own weakness gives way, and in part crumbles into the ditch. Necks, cheeks, and throat—all now have disappeared; and of the outline of that stern formation, nothing remains but a distorted mouth, with the broken wattle of gabions and the stakes of fascines sticking confusedly out along its extended jaw; and there, too, is the remnant of a sand-bag, caught upon a bending twig, waving lazily with the wind as if begging a truce.

Who will dare stand among the ruins? Here comes a sapper followed by another from behind a traverse to survey the desolation. Well is it that night approaches to cover the adventure. It is more than dusk already. Into the breach they vault with fluttering hearts, for no panoply guards them; no helmet, no cuirass, protects them. Soon the emotion passes and the calmness of extremity prepares them for the worst. Each has his cap pressed down on his brow, and his greatcoat—pegged or pinned in front, with perhaps a solitary button to connect the breasts—is girdled with a couple of well-worn belchers or a piece of cordage. Removing the debris, they build up the faces with fresh materials handed to them by some constant linesmen. Now a gabion is fixed and others are forced into position in quick succession. Sand-bags are crushed into the baskets till they creak, and others, laid row on row, crown the work. Care is taken to give the necessary slopes to the cheeks to prevent

them tumbling down. All the interstices and crests are made solid with rammed earth and bags, and not a nook or chink occurs but something is found to jam into it to make it whole. Upon the merlon toils another sapper strengthening it with stones and earth handed to him by his assistants in the battery. Perspiration drops like rain over his beard, and, driven by his strong energy through every pore, moistens the rags which cover him from the night damp. Some bales of hides being brought, feeling makes up for the want of vision in so dark a night, and the cheeks are at length covered with hairy skins. Prudence has adapted their use as well to aid in preserving the embrasures, as to save them from flaming during the rapidity of our own fire. Now the sole of the opening is being improved and sloped. Up to the front the comrades push. So far are they away you scarce can see them. Deadly missiles fly onward and around and Minié bullets with a wheezing noise spend their force in the parapet. Who's touched? Neither. One however has had a ball through his cap. Still on they work with strength somewhat abated, but no deterioration of spirit, till a couple of gabions, struck behind by a shell, are forced outwards and knock down the operators. The fall of one is awkward, for his head overhangs the trench and the shelving slope of the sole threatens to shoot him headlong into the ditch. Catching at a stake he breaks his descent and wriggling back into the aperture, crawls to the spot where his exertions were interrupted. Joined by his comrade just rising from beneath a pile of broken sand-bags they recommence the restoration. Fair excuse this for suspending the work but undismayed they persevere. Eventually their toils end; their work is completed; and after six hours' exposure, they quit the scene uninjured. It is otherwise in the next embrasure, for one is mown down by a shot and the other badly wounded. Such is the fortune of war.

With all this danger, and though the fire from the Russians for the period comprised in the above table was fierce and destructive, the following men only were killed and wounded :—

- June 14th—Private John McRoberts—wounded dangerously, died next day.
" " John Murphy—wounded severely in the head, by rifle bullet, while in the quarries.
" 15th—Lance-corporal George Peter—wounded in the head and ear.
" 15th—Lance-corporal Stephen Daft—wounded severely in the left arm by grape-shot.
" 16th—Private William Smale, wounded dangerously, died next day. He was struck when working in the advanced trench approaching the Hedan. Tall, stalwart, and strong, few sappers were more active in the trench than he; few more skilful; and he bore the scar of a severe wound sustained by him at the siege on the 14th April.¹
" 17th—Corporal William James—killed by a shell which struck him in the chest.
" 17th—Private Thomas Patterson—wounded severely in the right shoulder by gun-shot.
" 17th—Private James Clyde—wounded dangerously, died next day.

For several days each embrasure in the fighting batteries had its sapper who was held responsible for its efficiency. It so happened, in No. 7 battery, on the 17th of June, a gabion had been knocked from the cheek and fell across the mouth of the aperture. In other respects the embrasure was sound enough. The artillery would not fire as long as the obstruction remained, and called upon the sapper—a young one—to remove it. Thinking the operation was needless, as it did not interfere with the line of fire; and if it did, that a single discharge would blow it out, he declined to incur the risk. Corporal Lockwood who was in charge of the sappers in the

¹ Unexceptionable as a sapper and an Ajax in strength and stature, Smale was nevertheless a grumbler by nature. This trait in his character was well-known to both officers and non-commissioned officers; and as in this state he invariably worked the hardest, it became a habit with many to endeavour to provoke his indignation. One day Lieutenant Graves, who was afterwards killed at the siege, felt it no compromise of position—the intercourse between officers and subordinates in war being more easy and unrestrained than in peace—to question in a jesting manner the usefulness of the second company. This was a subject he knew would ruffle Smale's plume. "Look here," said he, addressing the growler, "I have heard you boasting of the sapper qualifications of the second company, but from what I have seen of the men belonging to it, I can't say much in their favour." "Eugh!" mumbled Smale, clutching his pick and shovel, "the second company took Bomarsund, and you couldn't take Sebastopol without it." So saying he walked into an embrasure, and with the coolest activity patched up its shattered cheeks. This was the way poor Smale dealt out repartee. His retorts were all harmless, but usefully demonstrative.

battery, concurred in the propriety of the refusal, but leaped himself into the embrasure and threw the gabion into the ditch. The full blaze of day was on him, and as he bounded back to the platform, he was followed by a string of rifle balls which whizzed into the opening and harmlessly struck the cheeks.

Twelve days cannonading, sometimes warm, sometimes lessened to an insignificant demonstration, had, it was considered, so weakened the enemy's works, it was decided to assault the Redan and the Malakoff on a great anniversary day—the 18th of June. At one o'clock on the morning of the 17th the fourth bombardment began, just prior to which a brigade of carpenters had traversed the different batteries and examined and repaired all the platforms, while the remainder in both attacks, filled up holes and chasms in the parapets, and left every part in excellent condition for the fight. At that hour there were 72 sappers in the trenches, who were relieved at night by a small party of 35 men divided between the two attacks superintending a force of 700 men. On the 18th before a ray of light had broken the darkness. 44 sappers were in the lines, with 100 men to assist them on the left, and six only on the right. Whatever further repairs required were quickly executed, and the necessary scaling ladders, pickaxes, and shovels, laid out in the first parallel of the Gordon attack for the use of the columns then parading for the assault.

During the night Captain Du Cane of the engineers, in charge of the field electric telegraph, directed sergeant Anderson to sleep in the office at head-quarters, and be ready by two in the morning to accompany him and the staff to the trenches for the purpose of sending any messages from the telegraph cave which Lord Raglan might wish to despatch. He had barely turned in to take the little repose allowed him, when a mounted hussar arrived from Sir George Brown in command of the light division, bearing information to the effect, that the electric wires were cut and no communication could be held with head-quarters. Sergeant Anderson at once tried the instrument in the office and found the line incompetent. It was about ten o'clock. Not -

moment was to be lost; but it was a question whether it was possible by the hour named for the attack, to renew the lines. In an important point like this, there was no room for speculation. Much depended upon tact and quickness. The captain felt most anxious about it, and ordered the serjeant to test the line and repair it immediately. Lamed by a fall from a horse the serjeant was unequal to the exertion of running on foot, and so mounting the hussar's charger, he bounded off and arrived at the light division camp just as the stormers were mustering for the assault. Borrowing a lantern he threaded the line from the station, carefully examined the wires, and at last came upon the breaks which had occasioned the interruption. The wires had been cut accidentally by round shot or shells. With corporal Truscott he finished the lines a few minutes before the storming columns moved to the assault, and enabled Captain Ducane, who was well pleased with the prompt energy of the serjeant, to report to Major-General Jones the re-establishment of the required communication.

No. 13 battery of the left attack, armed with 13-inch mortars, had fired on the Russian works with tremendous results, but its efficiency was, in time, impaired, by the destruction of one of its platforms. It was of great moment to renew it, and corporal Borbidge and six carpenters commenced the work at four o'clock in the evening while the battery was still in action. A naval mortar required a ponderous arrangement of sleepers and planks to sustain it, for, with an ordinary charge of gunpowder, it has been known to make a vertical jump some six inches high and reach the stand again with a crushing jerk sufficient to shake the structure in every part. To meet concussions of such violence the platforms for sea-service mortars were invariably of the strongest kind. That constructed by Borbidge and his sappers—the type of many more—had, for its foundation, three transverse sleepers measuring ten inches deep and eight broad. Above them were laid, longitudinally, six beams eight inches wide and eight in depth, to which was spiked the covering consisting of massive planks nine inches in breadth and four deep. At the sides, ribands or stays of proportionate strength were

bolted to the flooring, and when all was completed the platform spread over an area ten feet square. This however gives but a faint idea of the amount of labour employed in producing it. After collecting the timber—principally old joists and rafters from ruined houses—it took those seven men, using their best skill and exertions, thirteen hours to complete it! The darkness increased the difficulties of its construction, and prepared as it was under a fire of some intensity with blazing shells dropping and bursting around them, the service was advanced to the dignity of an example for future imitation. It was ready for action at five o'clock on the morning of the 18th of June. Corporal Borbidge had the reputation of being a brave man. He was the tallest sapper at the siege, approaching in height six feet four inches, and the doubled-up positions into which he was forced by the peculiar exigencies of his work, did not in the least affect a stature which was admitted to be perfect in straightness and equipoise.*

To the French was assigned the attack on the Malakoff; to the British that on the Redan. Four columns of the latter were formed up; the first to enter the left face between the flanking batteries; the second the salient angle of the work; the third the re-entering angle formed by the face and flank; and the fourth, moving towards the Woronzoff ravine, to enter the right flank of the Redan. To each column was added a brigade of eight sappers and four carpenters laden with crow-bars, sledge-hammers, grapnels, axes, and powder-bags for removing abattis, palisades, or any other obstacles which

* Borbidge was never sick during the siege. For eight or ten days he was at Sinope collecting timber for huts. With this exception he was never from the front. But few sappers were oftener on duty than he, for his good health and usefulness passed him into the trenches seldom less than six times a week. It is melancholy to add, that this fine soldier was drowned on the 6th December, 1856, at Rochester, when employed in the demolition of the old bridge. The wind was squally, and while crossing a plank in a heavy French great coat, a sudden gust carried him into the eddying river among the shore piles. He was an excellent swimmer, and as soon as he had got his head above water, called lustily for a rope; but, before it could be thrown to him, or boats could push to his assistance, he was borne away by the current and sank about six or seven yards from the bridge.

might oppose the onward dash of the stormers, and also to blow down gates and barriers.

The right column to scale the re-entering angle was formed up in the trench leading out of the right of the quarries in the following succession under the command of Colonel Yea of the royal fusiliers :—

100 rifles, 1st battalion—skirmishers	} Under Lieut. Fisher, R.E., with sergeant John Landrey of the royal sappers and miners.
8 sappers and miners	
4 carpenters, carrying cutting tools, powder-bags, &c.	
50 rifles, each with a wool-bag	
60 rifles, carrying ladders	} Under Lieut. Graves, R.E.
60 seamen ditto	
400 storming party	Under Capt. Jesse, R.E.
800 supports.	
2 brigades of sappers for the lodgment	Under Lieut. Somerville, R.E.
400 working party, carrying 200 pickaxes, 200 shovels, and as many gabions.	

The other columns were marshalled in similar sequence in the foremost trenches, but it may be well to add the names and duties of the officers allotted to the left column, appointed under the command of Major-General Sir J. Campbell to attack the right flank of the Redan.

Lieutenant Murray, to lead skirmishers and sappers with sergeant John Coppin.

Lieutenant Graham, to lead the parties with wool-bags and ladders.

Major Bent, to lead the storming party and supports.

Lieutenant C. G. Gordon, to control the working party with two brigades of sappers.

Obedient to the signal, about half-past three o'clock in the morning the right column debouched from the quarries, the skirmishers opening out in good order and advancing steadily on the Redan. The spaces between the files exposed the sappers to a heavy fire, but they pressed forward led by Lieutenant Fisher, preserving their narrow rank compactly. Bravely moved the rest of the column headed by Lieutenant Graves, but the weight borne by the ladder parties did not admit of a dashing approach; the more so, as the seamen and rifles had to cross with their burdens, two old Russian trenches before they could lay hold of the skirts of the woolbag party. Lieutenant Fisher, nevertheless, strode on at a confident pace, not

too hurried, his sappers at his side, under a shower of grape and musketry; and on gaining the abattis, halted to receive the strength of the ladder party, as well as the stormers and supports. Standing longer inactive than he expected, swept by grape from the Redan, Lieutenant Fisher's party threw themselves down to await the moment when the column could rush forward, unclogged, to the assault. Interrupted by ditches, the riflemen and sailors bearing the ladders could only scramble forward. At every step they were smitten by unerring volleys and with them fell the ladders. All this time Lieutenant Fisher maintained his post with invincible command. To stand against a storm of fire with a bared breast was not an easy virtue, yet his men wavered not. Looking back with some anxiety to watch through the dim grey light the progress of the seamen and rifles, he could not see a single ladder. Minutes past and no help reached him; his men were falling fast and his straits increasing. Emboldened by the apparent hesitation which had held back the column, the enemy sprang upon their parapets and fired upon the little force which had the temerity to reach the barricade. Crouched as the men were under the boughs of the abattis and doubled up in shell-holes, they were somewhat saved from its fierceness, but every moment augmented the chances of their not returning. Cool and lion-hearted, the young engineer was everywhere among his parties commending their bravery and endurance; and sergeant Landrey, nobly assisting his officer, encouraged by his conspicuous example and his cheers the dislocated files of the forlorn hope. Still the ladders were unseen; the stormers were yet in rear, and, at length, as no means for scaling the ramparts were with the advance and its numbers were reduced to a handful, Lieutenant Fisher, seeing no officer present senior to himself, reluctantly, but wisely, retreated with his men to the trenches.

A beautiful instance of valiant humanity occurred in the retreat. Seeing a wounded officer lying near the abattis with a shattered leg, Lieutenant Fisher, assisted by a sailor, carried him some distance. Already fatigued by his exertions at the storming, he was soon exhausted, and private Jesse Head, push-

ing out from a piece of broken ground in which he had sheltered himself, took charge of the helpless grenadier and bore him into the trenches. So grateful was the officer for the devotion shown to him, that he offered the gold watch he wore to private Head, who, with the generous feeling of a chivalric soldier, refused the gift. The officer was shot through the leg below the knee. He was a very tall fine-looking man, belonging to a grenadier company of, it is believed, the 33rd or 34th regiment.

Meanwhile, the left column, under the command of Sir John Campbell, moved out of the trenches to attack the right flank of the Redan. The skirmishers went boldly forward followed by Lieutenant Murray of the engineers, leading the sappers and carpenters with destroying tools and powder-bags. All edged well to the left taking a sort of cart-track winding along the broken crest of the Woronzoff ravine. Close upon them were the ladders under Lieutenant Graham, who had in his party two able leaders, corporal Paul and private Perie. The sappers with this column belonged to the left attack and were less acquainted with the characteristics of the ground than those on the right. "Who of the sappers here know anything of the ground?" asked Lieutenant Graham. "I do, sir," cried Perie, with an impatience that evidenced his desire for selection, "I know every inch of it;" and he was accordingly appointed to head the sailors with the ladders. The hindmost spur of the hill was reached when tremendous peals of musketry and grape from the Redan, flanks, and creek batteries, made the skirmishers falter. Here they halted, lying down for a few minutes to spring onwards when the fire should lessen. Lieutenant Murray early fell severely wounded. Though agonising with pain he declined, after sergeant Coppin and private Mole had bound up his shattered arm, to be borne away by his men, and so alone and unaided he walked in a sinking state to the trench and soon after expired. His place was instantly supplied by Lieutenant Graham. Tall, commanding, and collected, vigorous in purpose and brave in danger, he took the direction of the contingents. It was now that Lieutenant-Colonel Tylden

rushed to the front to impart by his presence, spirit and confidence to the skirmishers. Barely had he approved of Lieutenant Graham storming the salient instead of the flank of the Redan than a grape-shot passed through his thighs and took from the crisis an engineer, whose valour and exploits blazon history. The truly generous neglect their own safety in the humane wish to administer relief to those who suffer. Lieutenant Graham first on the spot, raised him from the ground; and sergeant Coppin with private Ewen of the eighth company, both of whom more than once had proved their devotion to their officers, carried the colonel to a sheltered spot under a ledge of rock at the side of the Woronzoff ravine and there laid him down. Faint as he was from the loss of blood he would not retain the sergeant; and so dismissing him to his party, Ewen remained to soothe the colonel by his attentions, and later in the day to assist four or five sappers in bearing him from the nook to the camp.

Seeing no chance of an opportunity to make the flank, the skirmishers rose from the holes into which they had crushed themselves and retreated to the advanced trenches in the quarries. Some time was spent in filling up the blanks in the ladder men, who, as soon as the bearers were paired, were impatient to proceed. Corporal Paul was now strictly enjoined by Major Bent not to permit the ladder men to move a step forward unless orders were given for renewing the assault. It was difficult to fetter the impetuosity of eager men; but corporal Paul, an imperturbable sapper, displayed so much cool discipline himself, that gross indications of rashness were immediately restrained the moment his measured voice was heard among them. Once indeed for the exactness with which he carried out his orders, he was likely to have been bayoneted by a brave but inconsiderate comrade. Paul was not the man to flinch from any attack, or to repel one by a force as irrational as that which threatened him; and so simply lifting his finger, as if that were sufficient to ward off the thrust, the exasperated man, sobered by the corporal's composure, averted the weapon and both, at the proper moment, went on with the ladders.

In the same order as before, the stormers again advanced—this time to scale the salient of the Redan. When the ladders had passed to the front of the advanced trench, the skirmishers had moved so much to the left, that the sappers and escalading parties were much exposed. Lieutenant Graham now halted the sailors and riflemen to allow the skirmishers to rectify their position, and shelter in degree the sappers, woolpack men and escalading parties; but the firing on them continued so terrific, the skirmishers, valiant as they were, could not effect the movement; and the whole, by order, after standing for ten minutes bared to a ceaseless cannonade, were withdrawn into the advanced trench. Hopeless as it was to push on with so small a front, the struggle nevertheless could not be abandoned save on the gravest grounds; and arrangements were again made by Lord West, who commanded the storming-party, to essay the assault. Yet a third time the skirmishers re-formed with a front increased by a detachment of the 57th regiment led out by one of its captains, who soon fell. The sappers, too, were drawn up with their axes, grapnels, and powder-bags, so also were the woolpack men, and the seamen and riflemen with the ladders. Steadily and firmly they advanced met by a crashing and annihilating fire. Every step onwards was retarded by shocks which made the stormers desperate. A few more bounds were attempted, succeeded by another halt that showed the enterprise was impossible; and swept back by a continuous roll of musketry and shells no troops could withstand, the daring men who thrice threw themselves before the enemy, reeled back into the trenches defeated.

But few of the stormers succeeded in reaching the abattis. Of the sappers, there were at least four or five who gained it, or nearly so. Coppin and private Mole, belonging to the party with destroying tools, made the barricade to the left, while corporal Paul and Perie went directly to the front. All bent themselves behind knots of rock, or dropping into shell-holes or hollows, fired away with all the coolness of riflemen, such ammunition as they could collect from the pouches of the killed and wounded. When it was evident the day was lost, sergeant Coppin, directed by Lieutenant Graham, ran to the

front to command the skirmishers to retire. His mien was that of a calm man and a fearless soldier. He first communicated the orders to the officer in command of the rifles, and then to the sergeant of the 57th, as the captain who had led them to the front was killed. Coppin was thus one of the last men to return to the trenches. Paul and Perie were afterwards awarded distinctions, which but a minimum of their comrades attained. Besides a gratuity of ten pounds and a medal for distinguished service, Paul was promoted to the rank of sergeant and received the Legion of Honour; while Perie, an unlettered man but a first-class sapper and leader, was decorated with the military war-medal of France "for valour and discipline." Coppin, though it was not his good fortune to obtain a badge to show his merit, was, by the voice of his comrades, as brave and ready a sapper as ever toiled in the trenches.

Among the sappers with the right column there were five casualties:—

Private Thomas McNeil } killed.
 „ Joseph Barnes }

Lance-corporal Joseph Maycock, wounded in the head { Both were struck by
 Private Samuel Spear, wounded in the left knee . . } rifle-balls, and died
 of their wounds.

„ Edward Pearson, wounded in the hand.

Private McNeil, when found next day, was under the abattis riddled with balls. He was a good and an ardent soldier, and his comrades spoke in high terms of his bravery on all occasions. As already shown, he had his jaw broken in a strange manner on the 3rd April.

Captain Jesse, who hastened to the front to ascertain the complexion of affairs, was shot through the head while speaking to Lieutenant Fisher. Lieutenant Graves was also killed.

Three sappers with the left column were put hors-de-combat:

Private Robert Eadie—killed by a round shot which went through his chest and knocked him to pieces. He was with the Staff at the time bearing signal flags.

„ John Perie—wounded in right side, by rifle bullet.

„ William Preece—wounded slightly.

Two casualties occurred in the column under General Barnard, placed in position on the right of the Woronzoff road, viz:—

Private William Rollings—killed by the blow of a shot which rolled over a precipice on his neck and broke his spine. He was knocked a few yards down the hill, "where," an observer has written, "he sat as if asleep with his face turned up, but he was stone dead."

"Aaron Tickell—wounded severely; leg amputated, and died December, 1855.

Sergeant William Dobbie—wounded in the right shoulder by a spent 32lb. shot. He was the sergeant in charge of the sappers in reserve.

"I must not conclude," wrote Lieutenant Fisher, "without bringing under your notice the very gallant conduct of sergeant Landrey, whose steadiness in the advance, and exertions in cheering on the men were most praiseworthy." Lieutenant-Colonel Tylden, being unable to report on the operations of Lieutenant Fisher and his sappers, Colonel Gordon supplied the omission. "The officers of engineers and men," he wrote, "attached to this column, performed their duty in a brave and devoted manner. The non-commissioned officers and men bravely followed their officers, and were foremost among the assailants. Sergeant Landrey particularly distinguished himself."

In awarding high praise to the naval brigade for their noble behaviour with the ladders, Lieutenant Graham acknowledged "the steady conduct of the party of sappers under sergeant Coppin of the fourth company," and drew attention to the valiant behaviour of private John Perie. Alluding to the latter at another time, Lieutenant Graham wrote, "he was invaluable to me on that day, as he followed me everywhere, and was always ready when I wanted anything done." His cool determination in taking a message to Lieutenant Murray in front during the thick of the fight, and returning with an answer, was one of the instances which called for Lieutenant Graham's special commendation. When the assault was over, a naval officer, seeing a wounded man lying exposed in front, asked for assistance. With his natural brusqueness, Perie said to Lieutenant Graham, "I'll follow you, sir!" All three bounded over the parapet and brought in the injured man. Had further help of the kind been needed they would have humanely exercised it. The front fortunately was clear; and

so, anxious to prevent the chance of anything falling into the hands of the enemy, they threw themselves again over the parapet, and lugged into the trench some ladders from the open. The devotion of Perie to his brave leader was the more remarkable, as he had already been wounded by a rifle-bullet in the side.

Major-General Jones also made this record to the credit of the corps : "The royal sappers and miners continue to distinguish themselves by their gallantry and good conduct."

Under Lieutenant Neville of the engineers and Captain Penn, R.A., Sergeant Thomas R. Drew and 30 sappers, with destroying implements and powder-bags, were detailed to act with Brigadier-General Barnard's division, which, having marched across the Woronzoff ravine and halted under the cliffs, was to move forward and capture the Barrack Battery as soon as the Redan and Malakoff had been taken ; but the utter discomfiture of the two columns placed this subsidiary attack in the category of impossibilities. While the assault was still at its highest, corporal Jenkins obtained permission to go to the front to watch its desperate phases. He was accompanied by sergeant Drew. Keeping close under the beetling rocks, which in a measure shielded them from the gusts of fire that struck the steep and broken sides of the ravine, they at length reached the left flank of the advance trench, where for a while they looked at the doubtful strife, and returned to report its progress. Again they moved to the quarries by the rough unbeaten track they had previously traversed, guiding Lieutenant Neville and Captain Penn. A short reconnaissance determined Lieutenant Neville to send Jenkins with a message to General Barnard. Off he started, and communicated to the General the information he had been commissioned to convey. Colonel Waddy of the 50th regiment, who had been appointed to lead the stormers of General Barnard's column, expressed a wish to go to the front to see the aspect of affairs, if any one would show him the road. "Follow the sapper!" said Jenkins, using the phrase of the trenches ; and Colonel Waddy, glad of the offer, ran along under the brows of the rocks, whither the corporal conducted,

and found himself in less than ten minutes safe in the quarries. A few glances put him in possession of intelligence he did not expect to learn; the attack was failing; the scenes he witnessed were untoward and disheartening, but he still had hope of doing some service to retrieve the fortunes of the day. Placing himself again under the guidance of the corporal, the rough route by the hill-side was speedily retraced; and the colonel, boiling over with desire and anxiety, proposed to lead out the stormers at once without waiting the accomplishment of those operations which were considered essential before the secondary attacks should commence. But the orders for the movement of the column were too explicit and imperative to admit a deviation without special directions from the ruling authority, and so Colonel Waddy had not the honour on this great occasion to "do or die."

Jenkins now rejoined the officers in the quarries. This was his third march over that toppling hill-side, almost suffocated with dust and fatigued with a restless foot, which for six hours and more had been in active motion. Before this time the fate of the day was irrevocable; the cannonade had ceased, the stormers had retired, the open was clear, but a murderous cross-fire of musketry still played on our works. Seeing a wounded man of the 57th regiment struggling in front of the Quarry batteries, Jenkins and Drew volunteered to bring him in. To this Lieutenant Neville assented, and in broad daylight they bore him to the trench, resigning their charge to a party of the 57th in the rear. The poor fellow had been deeply struck in the right thigh and ankle and was torn with stones and splinters. A little later they saw other men lying exposed with bad wounds on the reverse of the advance trenches. With a broken stretcher, the sergeant and Jenkins carried away one after another into safe cover. This was a service of supreme risk, and many of the defeated stormers who filled the trenches, pale with enervation and panic, possessed nevertheless sufficient self-command to make their surprise obvious. "Look at those mad sappers!" said they, envying the courage they feared to exercise; but the humane non-commissioned officer, heedless

of the taunts that assailed them, never slackened their hand till there was no longer a necessity for their exertions. Again Jenkins pushed into the ravine by the old track. "A corporal of sappers came along the hill-side from the direction of the Redan," wrote Lieutenant-Colonel Sir James Alexander, 14th regiment.¹ "I asked him what was the news of the assault from the trenches of the right attack? He said, 'Bad news,' and in a few words he told of the disastrous events of the morning." The corporal alluded to was Jenkins. Seeing a comrade, private Rollings, killed and huddled up on the slope with a broken neck, he begged Lieutenant Neville's sanction to bear him away, as no sapper had yet been buried in the trenches. His request being granted, he, with the help of three volunteers, carried the dead sapper on a scaling-ladder across the ravine to the first parallel of the left attack, from whence he was removed to camp and honoured with a soldier's funeral.

Equally conspicuous was private George Ramsey in his endeavours to succour the wounded. He too belonged to Lieutenant Neville's party, and crept along under the rocks till he made the open. It was a wonder with so hot a fire of musketry that he escaped. He first removed a wounded sailor who had pushed himself into a rifle-pit; and afterwards, with the assistance of Lieutenant Mallows of the royal navy, then mate of the 'Wasp' steam-sloop, and a few men, he bore away on a scaling-ladder softened with wool taken from the sacks of the stormers, a brave rifleman who was struck down with severe wounds near the abattis.

The cool bravery of these three sappers was brought to the notice of Major-General Jones by Lieutenant Neville, who recommended them for distinguished medals. They "succeeded under a very heavy fire," he reported, "in rescuing the bodies of several wounded men of the 57th regiment lying out in front of the Redan."

The column under Brigadier-General Eyre was directed to push down the picket-house ravine past the cemetery into the rear of the Barrack Battery, and there co-operate with General

¹ 'United Service Magazine,' September 1856, p. 23.

Barnard in its capture. This column bore on with an irresistible front into the grounds near the graveyard, but were locked in among some houses of the suburb, beyond which it would have been more than madness to proceed. As it was, they held the position until evening under a harassing fire, and retreated with the loss of no less than 31 officers killed and wounded, as also the Brigadier struck in the head.

Of second-corporal William Baker, third company, who went forward with this column, a more than passing notice may be permitted. He was on duty in the third parallel, and left it without orders, declaring at all hazards he would that day enter the town. But how brittle is human intention! Armed with his carbine and a full pouch of ammunition, he joined the 38th regiment; and losing sight of the fact that he was not in charge of a working party in the saps, cheered on the men with the inspiring cry, "Now, my boys, follow the sapper!" In the excitement of the moment he caught up the expression, because it had become a settled by-word of the trenches. On went poor Baker, heedless of those who followed, and he was killed in the ravine beyond the grave-yard. Disembowelled, wounded in the breast, and with a broken leg, he lay for a time in great pain. He was seen to wave his hand as if entreating assistance, but so thick was the firing up the valley from the crow's-nest and garden batteries, none dared to pass into it to help the corporal in his last agonies.

The casualties in the English troops this day were very great. Both officers who led the column on the Redan were killed. In addition to the engineer officers already named, Major-General Jones was wounded in the head by a grape-shot; and his Brigade-Major, Captain Bouchier, received a slight contusion in the arm. The French, in their imposing but unavailing attacks upon the Malakoff, lost 2 generals, 37 officers, and 1544 men killed, wounded, and missing; while the Russians in their sturdy defence, achieved a victory at a sacrifice which counted thousands of killed and wounded. No less than 797 fell dead in the various works, and 4979 were wounded.

It was a terrific struggle and a memorable failure. Already

weakened by disease, Lord Raglan, ill able to bear the defeat, survived it only a few days. A warrior, trained under the Duke of Wellington, possessing in the highest degree habits of calmness, patience, and controlling perseverance, he was the fittest general in the English army at the time to bear the responsibility of a great and critical command; and the distinguished talent and bravery with which he conducted it, gaining three brilliant battles and sustaining a violent siege for seven months with only one drawback—that which cost him his noble life—his career as a commander-in-chief in a great war, will, in after time, meet the honourable reward it merits from impartial history.

General Simpson, the chief officer of his lordship's staff, succeeded to the command.

1855.

18th June—16th July.

SIEGE OF SEBASTOPOL.

Condition of the batteries; their repair—Alarm of a sortie—Noble intention of four comrades to recover the body of corporal Baker—Strategic occupation of the rifle redoubt behind the cemetery—Interchange of civilities between the Russian and English truces—Capture of a memento—Escape of Lieutenant Donnelly and lance-corporal Veal—Lodgment in the cemetery—A sortie frustrated—Destruction of the rifle redoubt—No. 18 battery, right attack—Perils in the saps in advance of the quarries—Progress of the works—Re-occupation of the cemetery—The stone double sap; corporal J. T. Collins—The two Dromios—Industry of the miners—Progress of the works and repairs—Even during a storm—Advance of the chevaux-de-frise up the Woronzoff ravine—Sappers annoyed by light balls—Difficulties in executing the works—Demolitions in the rear parallels—The Picket-house—Approach to the cemetery—Wooden bridge—General officers' hut—Abstraction of gabions by the French—Gallantry in pushing the sap from left advanced parallel, right attack—Night details—No 15 battery, left attack—Obstacles to success in commencing the fifth parallel, right attack—Trenches in the cemetery—Progress of the works—Conduct and exertions of the engineers and sappers.

By the enemy's fire, a number of embrasures had been seriously damaged or demolished, and their early fall was ascribed to the unsubstantial manner in which they had been built under the superintendence of some young and inexperienced sappers fresh from England. The works which bore the brunt of the fight were the 21-gun battery and Nos. 13, 14, and 17 on the right attack. The first had ten embrasures in ruins, while the remaining batteries scarcely retained a vestige of resemblance to their original construction. At night there were 20 sappers on the right, and 22 on the left, assisted respectively by working parties

of 100 and 273 men. Many of the damaged embrasures were rebuilt before morning; a passage was widened round the traverse in Egerton's pit for the passage of guns, and a number of gabions which had been thrown down or fractured during the bombardment were replaced in the zig-zags leading to the quarries, and in the saps issuing from them. The platforms which had been stoutly laid resisted with firmness the violence to which they had been subjected, and the magazines withstood an exasperated cannonade with remarkable success. Several scaling ladders which had fallen with their intrepid bearers in the unavailing assault, and many of the abandoned wool-sacks were removed; and it was due to the endeavours of a few spirited volunteers, that about twenty-five men, found on the field disabled by frightful wounds, were carried to the trenches.

. At midnight there was an alarm of a sortie among the French in front of the Mamelon, which rapidly spread to the quarries. A brisk play of projectiles took place on both sides, in which the men in the rear trenches heartily joined. Without a real object to deserve such warmth—for the Russians had not left their works—they necessarily fired at random, and some of the workmen in the foremost trenches were wounded from our own missiles.

A wounded sergeant of the 3rd division had crept into the lines next day, and reported that a corporal of sappers was still alive in the garden. Four of his comrades—corporals William Donald, John Medway, Samuel Varren, and Robert J. Fitzgerald, all of the third company—with a nobleness of feeling that did them infinite credit, agreed, though not on duty, to go out and bring him to camp. Accordingly they pushed into the trench in front of the caves, and seeing, by the aid of an opera lorgnette, that Baker was motionless, they were desired by Lieut. Donnelly to defer the attempt, as a truce would shortly take place, which would enable them to recover the corporal without peril or molestation.

Major-General Eyre wanting support, was compelled to leave the cemetery he had gallantly taken on the 18th. Conceiv-

that circumstances favoured a bloodless appropriation of the rifle-pits near the cemetery, Lieutenant Donnelly secured the services of these four men to accompany him; and while he collected twenty volunteers from the 20th regiment, private Fitzgerald was sent away to get ten riflemen. Communicating his orders to the officer commanding the covering party of the rifle brigade, the number of men were soon made up; but before Fitzgerald arrived with the detachment, Lieutenant Donnelly had gone with his party from the left of No. 11 battery down the ravine to the garden, where, as the firing was hot, he and the volunteers were obliged to lie among the grass and fruit trees till a momentary lull gave them an opportunity of moving cautiously to some suburban houses, among which they dodged, and then crept on all-fours to the wall of the cemetery, where they concealed themselves. Meanwhile Fitzgerald leading the riflemen, started from one of the boyaux behind No. 7 battery, and dashing down the hill under a close fire—for all were exposed—they reached the garden wall nearest to our trenches. It was some five or six feet high, built of dry rubble stone, behind which, as they were blown by their fleetness, they halted to take breath. Relieved by a brief stay, Fitzgerald, the first to spring over the wall, was followed by the rifles, like bloodhounds in full chase; and redoubling their speed, raced onwards under an incessant rattle of musketry, stopping not till they had joined Lieutenant Donnelly at the cemetery wall.

Another move was now made to the head of the ravine, where Lieutenant Donnelly placed four men in the first pit, and pushed on to a more commanding pit on a green knoll; but, unable to occupy it, he distributed his volunteers, for safety, among some trees and old walls in the neighbourhood. While these dispositions were being enacted a truce was agreed upon, which turned the young officer loose on the little Mamelon, around which he placed his detachment as sentries. The Russians regarding the pits as in our possession, did not ascend the mound, but an officer, disinclined to yield the spot, passed the sentries; and after scrutinizing the locality with speculative

curiosity, returned to his men. The four sappers then went in quest of Baker. When found, he was dead, and had been so for some hours. He was, therefore, borne away to camp.¹

At last the melancholy duty of giving a rough and uncere-
monious sepulture to the many dead was accomplished, and
Lieutenant Donnelly descending the mound, moved to the
nearest rifle-pit, as did also lance-corporal James Veal, who
bore the white flag. Whilst standing near the pit, shrouded by
the sacred truce, two rifle shots, and shortly after, a score or
two of Miniés were aimed at them. This angry attack was no
doubt occasioned by the report of the officer who forced the
sentries. It was useless now to wave the banner to seek pro-
tection under colour of the truce, and as little hope for their
lives was left them, they depended upon the tact they could
exercise to effect their escape. Lieutenant Donnelly jumped
over the parapet, and as he ran, a constant fire, which would
have appalled many an older head, neither made him falter nor

¹ A Russian officer who could speak English fluently had charge of a search-
ing party to collect the dead. Entering freely into conversation with an officer
of the 14th foot, he expressed a hope that the day would soon come when the
belligerents would again be cordial friends. Warming with the occasion he
asked the officer and his men if they were disposed to make any exchanges
with him as pledges of the interview and probably hereafter of recognition.
Corporal R. Jasper Fitzgerald of the third company, was specially spoken to by
the Russian; and feeling in his pockets to meet the wishes of the inquirer, men-
tioned his regret that he had nothing to offer except a penny. "Let me see it,"
said he, and Fitzgerald at once presented it. "Ah!" exclaimed the Russian
officer with evident pleasure, "It's one of old George's! If this is a fair ex-
change you are welcome to it." And the good-natured officer handed Fitzge-
rald a handsome silver devotional cross. To the British officer he gave a silver
snuff-box.

In the peregrinations Fitzgerald felt it desirable to make to increase his ac-
quaintance with the locality, thinking it not improbable he might soon have a
"job" there, he entered a house near the cemetery, and not wishing to quit it
without some memento of his visit, nothing apparently turned up for accept-
ance more valuable or less portable than a sofa! A burly sailor and he
shouldered the huge piece of Russian furniture and stumped away with it won-
derfully tickled with the idea of the fun it would occasion when they reached
the trenches; but while jogging on, an alarm being given of the termination of
the truce, the bearers instantly dropped the "family seat" and ran for their
lives. The alarm proved to be a false one, and Fitzgerald and the jolly Tar,
having like coursers retraced their steps to recover the spoil, found that
swifter feet than their own had taken a fancy to the prize and were loaded with it.

stay his course ; and he reached the trenches, as if an egis had shielded him, without a stroke. Veal remained in the pit, assailed by an incessant shower of grape and Miniés, shot and shell, which made gaps in the screen that covered him. There he stood till the darkness fell ; when stealing unperceived from the danger he had for so many hours outlived, he scrambled ahead as best he could, and picking his way through the suburbs and gardens, hastened up the hill-side to the 5-gun battery in the first parallel, with the same scathless fortune as his officer.

This strategic episode opened up new advantages which were instantly turned to account by the besiegers. Strong parties were sent into the cemetery grounds to extend the lodgment as far as the vineyard wall. A communication was likewise opened to it, in part, from the fourth parallel. Near the vineyard, however, the Russians burnt down some houses, which enabled them to see into the position and worry the workmen. In the night of the 19th, corporal Lockwood had with him a party deputed to a portion of the duty. From the left of No. 7 battery, which overhung the ravine in rear of the caves, he marched along the side of the hill, and, diving into the valley, entered the cemetery through a door-way in the stone boundary wall. His men threw up a parapet from the wall to some rifle-pits ; another party under corporal William Donald, continued the trench from the pits, which afterwards became the left portion of the fifth parallel ; and a third party under corporal George H. Collins, worked from the fourth parallel down the hill to meet the trench opened by corporal Donald. These three parties were superintended by sergeant Coppin. The firing on the cemetery and the new trenches was fierce and constant ; grape and shells fell in incessant showers ; and in corporal Lockwood's party alone, no less than fourteen men were killed and wounded before day-break. In the face of so much hostile activity, with sheets of flames from the burning village lighting up the work, it was not an easy matter to labour, but yet the sappers and linesmen persevered for a time in placing and filling no less than eighty gabions. At last the

working party, among whom so many casualties had occurred, decamped, leaving their tools behind them, which were carried away by the sappers, who returned twice to the deadly trenches to complete the removal of the stores and the muskets of the killed and wounded.

For a few nights the work continued under circumstances of great peril. Flights of bullets were levelled at the workmen from musketeers, who, having crept up among the smouldering houses in the vineyard, and sheltered themselves in unseen positions, calculated too truly—from their previous occupation of the place and their foresight—where the besiegers would be appointed to toil. In the night of the 21st it was hardly possible, except at a prodigal loss, to employ more than twenty men and three choice sappers in the lodgment. Covered by a party from the 4th foot under the command of Captain Dowbiggen, who had judiciously posted his guard to make the most of any sudden attack, the workmen repaired the breaches in the trench, and filled as many gabions as it was found practicable to stake. The linesmen and sappers were directed by Lieutenant C. G. Gordon of the engineers. A body of Russians advanced with a cheer towards the cemetery from the vineyard and threatened by their strength to annihilate the little party; but their fire having been returned with more warmth by the guard than was anticipated, the Russians, doubtlessly possessing a delusive notion that the cemetery was held by a powerful force, retired without personally contesting an occupation which would have ended to their credit. That the gallant bearing of the party had deceived the enemy is almost proved by the fury with which it was plied. During the whole night four mortars played on them from the garden batteries; and frequent shots and grape raked them from the Creek and Barrack batteries causing among the steadfast sentries and the industrious sappers and workmen about twenty-two casualties.

It behoved the engineers to proceed with caution in so fatal a spot, and if they could not readily adapt the cemetery to their own purpose, to make it inoperative to the enemy. At the

time, the sacrifice of life in working it was more than the advantage of its retention ; and it was, therefore, determined to destroy the position and evacuate it. Quietly and quickly were the entrances from the Russian works into the pits filled up, and other depredations committed to nullify communication with the cemetery and little Mamelon behind. In the night of the 22nd, in order to extend the demolition, five sappers under Lieutenant Neville of the engineers, crept into the rifle redoubt above the cemetery with destroying implements. It was a covered loop-holed ambuscade made up of old doors and window-shutters. No time was lost, for the duty was one of imminent risk. Mounting the work, the sappers throw down about thirty-five feet of the splinter proofing, and, hurling it into the ditch, concealed it from observation by a covering of earth. So hard and zealously did the sappers work under a heavy fire of grape and shells, that their names were recorded for the notice of Lord Raglan. Second-corporal George Henry Collins, and privates David Muir, William Goddard, John Ford, and William Eddy, were the men engaged in this intrepid demolition.

The operation was repeated the next night by four sappers under second-corporal Trimble, who worked for four hours filling up the old Russian trenches, while a rattling musketry, intermingled with crashing projectiles, scarcely checked the vigour of their exertions. Though not wholly destroyed, the ambuscade was abandoned, marked only by one trifling wound among the men and the breaking of a shovel helve in the hand of the industrious man who was using it. When the night of the 25th had well advanced, Captain Belson, unaware that the screen had been relinquished, told off a working party to augment the ruins ; but finding it unoccupied by a guard, he distributed his men to the general trenches, and went on with corporal Stredwick and a few cool sappers to complete what human energy had not time as yet to accomplish. There was no cover, except what the few standing grave-stones offered, and even this was questionable from the many sharp-edged fragments which, chipped from the slabs at every stroke of shot

or shell, fell among the party. A heavy fusillade from sharpshooters in the screens made the situation of the sappers very critical. They worked, nevertheless, with a manliness that gave a noble aspect to labour; parapets were thrown down, ditches filled in, and timbers dislocated; but at length, as a sortie was apprehended—of which there were unmistakeable indications, for the enemy was seen moving up in broken bodies to the little Mamelon—the sappers were withdrawn by Captain Belson from the enclosure without even a scar to tell of their endurance and danger. It was a lucky escape, for a few minutes after, the Russians were in the pit.

A new battery—No. 18—for six heavy guns was reared under many difficulties, to rake the middle ravine and throw its metal into the Redan and the Malakoff. It was built on the swell of a trench a little in advance of a group of zig-zags and lateral excavations issuing from the second parallel of the right attack. The work was commenced on the 23rd June, and does not appear to have been wholly completed till the 7th July. Strong parties worked in it at each relief, and when finished, its revetments, standing up in the most solid and approved forms, resisted with some tenacity the crashing cannonade brought to bear upon it.

In the advance trench on the right of the quarries, the sappers, for three or four nights, had to watch with more than usual solicitude in making way against the perils which threatened them. It was good work to place as few as twenty-six gabions in this exposed situation, for the moon shining brightly in the heavens discovered to the enemy the true character of the progress effected; and being within about 300 yards of the Russian batteries, it needed that the men entrusted with the operation should be as collected and brave, as resolute and dextrous. As the moon rose with its meek but tell-tale face, the four sappers were obliged to quit the head of the sap and retire where the cover was thick, to protect them from the projectiles, which frequently overturned the baskets; but when the luminary was dimmed by a passing cloud, which made the gabionade appear indistinct, the sappers

rushed forward, reset the overturned gabions, and staked as many more as the duration of the obscurity permitted. In this way was completed a line of initial revetment extending to about 45 feet. No pickaxe could be used or blasting resorted to in the vicinity of the sap. The gabions were, therefore, filled by fits and starts with earth gathered at a distance, brought to the work by thirty linesmen.

On a subsequent night the sky was almost cloudless, and the moon gleamed with so much clearness, that the danger of working the sap was as great as if conducted at noon-day. There were four sappers in the advance and fifty of a working party. When only a gauzy cloud moved between them and the moon, the former, bounding as from a lair, leaped a-head with the gabions and employed the transient intervals in giving them a place. Their exertions were carried on in paroxysms, and a night's vigilance and ardour only counted the lodgment of nine gabions! So fearful was the risk of achieving even this trivial progress, that none but sappers could be confidently allotted to it. The line was, nevertheless, beneficially tasked in strengthening the cover of less exposed works.

Activity was the order of the trenches. Proud instalments of progress in every direction showed how well the men toiled, and how expeditiously they converted the enemy's formations into terrible constructions for the future siege. On the right, the quarries, far in advance, were turned into formidable defences. They were strong by nature but vastly improved by art. The high gabions and flour barrels which faced the enemy's revetments, were made to serve similar purposes in the besiegers' works. Those quarries became the park for the front, in which was erected the engineer hut—scarcely bullet-proof—from whence orders were dispersed with cool despatch by the officers charged with the execution of the several works. From thence issued the fourth parallel—partly a Russian entrenchment—which cut up the hill and extended as far as the middle ravine; while approaches shot out daringly in front from the left of the old ambuscade in hazardous contiguity to the Russian lines and pits. Against the incessant firing of

clear-sighted sharpshooters it was difficult to stand and persevere; yet on went the sap, sneaking stealthily forward like a huge snake, till branching off on either hand, it stretched its length in another parallel in front of the Redan. Three boyaux, cut on the crest of the hill in advance of the quarries, led to the fifth parallel; which, pushed along by energetic men, joined an abandoned Russian trench that breasted the left flank of the Redan, and run along ridge and glen to the famed Mamelon. Old magazines evincing signs of decay were revived, new ones constructed, and traverses, platforms, and the unending appurtenances of a gigantic siege, were made, repaired, or reformed. Instances of instability in the batteries had occurred, which caused the embrasures, &c., to be rebuilt by experienced hands. The 21-gun battery had past its day as a *dépôt*. It was no longer the heart of the system, communicating life by its supplies to the arteries of the hills. Stupendous as it was, it lost everything but vitality, and the importance it had once acquired was now possessed by the quarries.

The weather had settled with intolerable heat, and a blazing sun beaming in a sky of unbroken blue, bronzed the lean faces of the workmen, and, sweating their spare frames, affected the stamina of all. A thunderstorm interposing, cooled the air and moistened the rock. It was an auspicious visitation, for it lessened the oppression and parching to which the workmen were subjected. The rain fell in torrents, and gushing down the ravines in floods, tumbled over balls, fragments of shells, and clods like so many cascades. Young trenches were inundated and older ones in some places covered with water ankle deep. Fears were entertained for the stability of the works and the efficiency of the drains, but when the tempest had ceased, so little was the damage done to the batteries that the necessary repairs were executed in a few hours. The water channels, on the contrary, were much impaired and became one of the chief difficulties in conducting the siege. At this period the number of the corps available for trench duty was 351 only. The sick present were 110 and those at Scutari, &c., were 51. The force detached to different places to carry

out the multifarious services for which sappers were constantly demanded was 160. The total strength in the Crimea and in Turkey, as these details show, was 672 of all ranks.

On the left attack the Mamelon Vert above the Cemetery having been taken by the French, the post in the graveyard which had been abandoned was reoccupied in the night of the 27th by a British picquet to protect the right of the allies. The works in it were speedily turned and traverses constructed to ward off the firing from the Flagstaff batteries; while the enemy, confined within the main line of his defences, scarcely dared pit a rifleman beyond the chain. A brigade of sappers followed by a working party descended the side of the ravine warily pushing on gabion after gabion, and then trenching along its bottom and driving through rocks and unsheltered ground, at length reached a wall through which a breach being quickly made, on went the trench in the direction of a lone house in the valley, and in time was extended by blasting to the cemetery.

By the 27th of June, the covered-way, termed by the sappers the "stone double sap," to protect the two large caves or "ovens" where a strong day picquet was posted, was completed. Like a terrace it run along the slope of the picket-house ravine among steep and jutting rocks, for about 300 feet, and was hollowed, every inch of it, by mining. Its face was between three and four feet high of solid rock, and above was placed a revetment of gabions, powder cases and bread-bags filled and backed by fragments of stone blown up in the blasts and macadamized. Sand-bags were also used, and earth brought from the rear was shovelled among the stones to make the mass compact. To protect the trench from enfilade, six traverses of rock were formed as the work proceeded; but a bold one, seven feet in altitude, facing the mouth of the first cave, pushed across the trench for 22 feet, and possessed a breadth adapted to the object it was intended to serve. A curved continuation of the trench, stretching up the hill for 100 feet, rounded the second cave, whose enlarged mouth opening on the Russian batteries required strong cover to shield the chamber from the enemy's fire. A parapet was

therefore risen like a butt, some 16 feet broad at the crown, which stood well against grape and shot and averted dangers it seemed incapable of meeting. The revetment started from a foundation of rock built up to the necessary height with sand-bags. Subsequently it was thickened with earth and stones six feet broad, and faced inwardly by a row of large beef barrels crammed with rock and clay and crested by sand-bags. The caves themselves were connected by a cutting effected by four hard-working sappers under lance-corporal Simon Williams. Two cut from one cave, two from the other, descending on either side into easy soil to avoid the rock. Where the latter occurred, it was removed by points and hammers. The passage, about 26 feet through, was five feet six inches high and three feet three inches wide, and was completed in ten hours. A free communication was thus open from one to the other without the necessity of passing into the trench. Avenues were opened from the covered-way to the rear, and forward by a long arm, which, joined to a succession of saps like so many prodigious limbs or joints, skirted the ridge overlooking the ravine, and then connected with the fourth parallel. The approach from the caves to the communication leading to the parallel was by a natural opening in the surface of the hill, widened into a man-hole by the jumper and mining. At its base there were five or six stairs hewn out of the rock, on which was super-added an oaken ladder slanting to the top of the shaft; the entrance to which was screened by a semicircular revetment of beef barrels loaded with stones. This covered-way was of great importance, extremely difficult of execution, and as hazardous as laborious in working it. When finished, it was so perfect a cover, that the picquet quartered in it sustained a daily fire with impunity. Corporal Joseph T. Collins under Major Bent, was its plodding and steadfast overseer. He had with him six picked sappers and three miners of the 68th regiment, who were specially allotted to the task. More than three months were spent in its accomplishment, during which, and the forming of the correlative communications, corporal Collins was daily in the trenches. In that time many a bullet whizzed

near him, and many a shell burst, splintering the rock and tearing down the barrels and sand-bags in his front and rear, but he neither dropped his head nor slackened his hand. Ardent, cool, and efficient, his example and exertions were of undisguised advantage in the prosecution of the sap, and his resolution to be compassed by no obstacle had the effect of establishing among his comrades a spirit to persevere and succeed. Once only was he struck while driving the sap. A blast went off unexpectedly, setting a shower of stones in motion, one of which hit him above the eye, and another, of crushing size and weight, hurtled past his breast. At last he was overtaken by a serious wound. On the 2nd of July he was passing through No. 14 battery left attack, when a rifle bullet pierced his thigh and took him from the trenches. Three months, save one day, 18th June, when he was granted the luxury of a little extra repose, he was daily under a fire of varying fierceness, and for his intrepid conduct in the "stone double sap," coupled with other conspicuous acts of skill and fearlessness, he received two steps of promotion, was granted a gratuity of five pounds, decorated with a "distinguished service" medal, and also with the star of the French Legion of Honour.²

Hourly the assailants encroached on the area which separated

* The corporal belonged to Captain Brine's company. With a warm appreciation of military merit, the lady of the Captain presented Collins with a miniature legion of honour, in order to impress the Queen, when she reviewed three of the Crimean companies at Aldershot, with a more adequate notion of his services than would have been conveyed to Her Majesty had he only worn the ribbon of a chevalier. At that time the French decorations had not been issued to the troops.

He had a brother with him in the Crimea, so exactly like himself in face, figure, and speech, it was perplexing to say which was Joseph which George. The old story of the two Dromios, to a certain extent, was acted over again in their persons. Both were useful and brave; neither more so than the other. Joseph obtained all the honours which a gallant soldier could claim and to which he was fully entitled, but George seemed to have been totally eclipsed, no one could explain how, by his brother. Joseph, indeed, was considered to be George, and George the veritable Joseph; and so in this "Comedy of Errors," George, by the misfortune of resemblance to his brother, was lost among the undecorated.

It is almost a marvel to add, that Joseph, though a first corporal, wearing

them from the besieged, beset in their industry by strange and incessant difficulties. Almost within hail of the Russians, the miners day and night carried out their tedious labours. As many as forty sappers were frequently thus employed in the advanced parallels and boyaux. A number of the line, between 80 and 100—practical quarrymen—afterwards joined them, who, directed by experienced corporals of the corps, worked with unwearied exertion. In sets of threes they carried out the operations, one turning the jumper while the others struck it blow for blow as in a smithy with hammers of about seven pounds' weight. The constant clashing of these heavy tools, which could even be heard at the camp, made the lines as alive with din and rattle as an arsenal, and brought on the miners a fire at time so furious, that to see them, amid casualty and death holding to their employments, was a scene not to be surpassed by any spectacle of endurance in the trenches. Excavations cut by the pickaxe or blown into trenches by blasting, completed, so far, a series of communications which, like so many ligatures, tied together the several works in front and rear. Elaborate with entrenchments and batteries, the ground with its mammoth parallels, subordinate approaches and passages, *places d'armes*, rifle pits and screens, appeared like a vast labyrinth puzzling to the last degree; but to provide against chances of miscarriage, the engineers and sappers, forming a corps of guides, so led the workmen by night and by day, that few parties failed to reach the sites where they were appointed to toil. Yet with all this duty and peril, only two sappers were wounded between the 19th and 30th June. These were sergeant Philip Morant severely in the right cheek, the ball passing through his nose and escaping from the other cheek; and corporal James Douglas slightly in the head. The former who was the sergeant of the trenches on the right attack was working in the quarries when struck; the latter had just told off a brigade of sappers and 200 of the line to the works.

orders that now of his rank had obtained, deserted from the corps soon after landing in this country from Sebastopol.

July found the siege a fixed employment, increasing in magnitude and approaching nearer to the Russian batteries. On the 1st, there were 24 sappers on the right and 57 on the left blasting in the fourth parallel, as also in No. 15 battery and the reserve ammunition magazine. With these they carried out various services in connection with batteries 13, 14, and 15, situated on the third parallel, which, from their prominence, shared largely in the hostile attention of the Russians. Their parapets which had been riven and loosened by the cannonade and washed down by the rain, were raised and strengthened; and their cheeks insufficiently sloped when originally built, were taken down and reconstructed; terrepleins were also formed in them and new magazines reared, with passages cut round the sites; while a strong body of miners improved the old road communication from No. 5 battery in the first parallel to No. 9—the left end battery—of the second parallel. On the right, Nos. 14 and 18 batteries had large parties appointed to them. The latter, a new formation, had no less than 160 men shovelling earth on the parapet, and eight sappers fixed the frames and splinter-proofs to its magazines. No. 14, occupying nearly a central position in the second parallel, had two of its embrasures cut and formed by the sappers. Others were widening approaches and communications, draining the second parallel, making a rifle pit in front of it, constructing sea-service mortar platforms on left of the 21-gun battery, repairing the parapet in the left communication to No. 18 battery, and removing revetting stores from No. 6 battery in the first parallel to the new works in front. The working parties consisted of 600 men; and though shelled with some briskness during portions of the day, all left the trenches unharmed.

Next day at dawn, 56 sappers, chiefly miners and carpenters, were sent into the foremost trenches on the left to blast the rock and lay platforms in the new batteries. They were unassisted by the line workmen, for a drenching rain confined them to camp. As from waterspouts the torrent fell, choking up the channels, inundating the works, and beating down some of the more fragile batteries. In such weather it was out of the question to

continue the mining; but every man though wet and smoking with heat, exerted himself in clearing the standing water from the different formations. On the right attack there were 310 men in the trenches during the storm with 28 sappers under Captain De Moleyns. The second relief, at 3 o'clock, gave 200 men with 20 sappers, while the numbers furnished for the left attack were 400 under Major Chapman, assistant engineer.

In the following night 800 men, guided by 24 sappers, were sent into the right attack, and 150 of the infantry and 25 sappers into the left. The *chevaux-de-frise* in the Woronzoff ravine, which did good service in checking the advance of the enemy's riflemen, was now moved from its original position to one in line with the memorable quarries, so that the rear works were not likely to be attacked by Russian columns stealing up the valley. A banquette was also made behind the iron barricade for a row of sharpshooters to pick off the artillerymen serving the Russian guns. The firing on various parts of the works was heavy through the night, and bouquets of shells were discharged with no better effect than slightly wounding three or four men, one of whom was private Thomas Luscombe.

On the 4th at night, four sappers and fifty men in the right portion of the trench in front of the quarries, pushed the sap to the right and widened and deepened the passage that led to it. Two light balls sent among them fell so near, one in front the other in rear, that, enclosed for nearly a quarter of an hour within a blaze, they were compelled to bend under the low parapet to save themselves from the effects of a furious shelling. Relays of grape succeeded, intermingled with Miniés, all striking the work but none injuring the workmen. Stout as was the opposition no less than twelve gabions were fixed by the sappers, and more would have followed, but the moon, appearing with a steady light uneffaced by driving clouds, caused the party to be withdrawn from the trench.

As cover could not be procured with sufficient expedition in the saps, earth was brought in baskets from a distance to make

screens for the miners whilst blasting the rock. Excessive was the labour necessary to form the foremost trenches, and the perils attending the exertions of the miners, who made head against extraordinary difficulties, were only mitigated by wiles which experience and vigilance had taught them to employ. It was a subject of astonishment how the rock—that giant obstacle which appeared in every trench—could, in the face of a keen enemy, be thrown up and worked into solid mounds of parapet. A passage was cut that night in a novel manner with as much design and self-possession as on an English railway. One party descended the hill, the other forced up from the valley; and though the labourers encountered no end of trials from the obstruction of rock, they effected a junction, building as they proceeded, a parapet two feet six inches in height. The miners were brawny fellows—each, in truth, a Hercules. Nothing overmatched their strength and industry; every foot driven in advance was full of interest; and in a few nights more, an uninterrupted communication of 250 yards with sufficient cover was completed from the left of the round hill parallel into the sombre graveyard. This parallel was a wonderful work. Its most advanced point was a place of arms. From its form and strength it was called by the sappers “the double elbow.” Jealous of the gradual development of our colossal system of saps and batteries, the enemy poured streams of grape and canister into the advances, causing many casualties. Hand balls in groups of forty or fifty thrown from mortars, were added to the roll of deadly agencies employed to pick off the miners.

No longer of use, the old engineer hut in the first parallel was pulled down and the barrels which made it splinter proof, were turned to account in improving the revetments of Nos. 14 and 16 batteries on the left attack. The picket-house battery, No. 6 armed with three heavy guns and three 10-inch mortars, posted on the French side of the ravine, was also demolished, and its serviceable materials used in the advanced works. The battery took its name from a deserted residence that stood in the glen a little below it, and which, from the com-

mencement of the siege was occupied by a picket. The picket-house, known as such, *par excellence*, was situated on the crest of the Woronzoff ravine to the rear of the 21-gun battery. It was first the look-out place of the generals, and lastly the rendezvous of officers and amateurs of all countries; but even that interesting quarter yielded to the devastating necessities of the siege and was razed to the ground by some sappers. Its rafters, planks, and doors, torn by many a shell, were converted into platforms and splintering for magazines and huts. By degrees the walls were removed, chiefly for building hospitals; and fragments of wood, turned into articles of taste, were retained by the curious as memorials of the picket-house. Nothing was left of that celebrated structure, associated with so many exciting reminiscences, but the crumbled vestiges of its humble stateliness designated by the French "La ruine des Anglais."

Corporal Lockwood on the 7th had charge of fifty men and three sappers forming a parapet with stones in the communication leading from the fourth parallel to the graveyard. The sappers attended to the building of the wall and the line handed to them the blocks and fragments. In time not a stone could be found not even as large as a walnut; and in order to keep the builders at work, the corporal spread a few of his party over the hill side in front to collect matériel. In this situation they were uncovered. Just then a fire-ball dropped among them, and on came discharges of grape and shells which struck down the corporal wounding him severely in the right thigh by the splinter of a shell.

About this time the sapper carpenters built a wooden bridge across the communication from the fourth boyau to No. 14 battery on the left attack. The battery rose out of the centre of the third parallel, and the approach stretched obliquely across the hill. This and one or two other similar constructions were the only instances during the siege of bridges being thrown under fire. The ramps formed out of the solid rock were blasted and shaped by six miners. Indeed the entire communication, about sixty feet, was driven through rock with no little skill

On the right the sapper carpenters erected a splinter-proof hut for the general of the trenches in the new zigzag from the left of the second parallel. The struts and timbers were strong and braced, to resist, as far as contrivance could ensure safety, the shocks of heavy projectiles. Its roof was formed of fascines resting on rafters, thickened by three layers of sand-bags with earth riddled in among them to fill up the vacuities. The hut was nine feet six inches long by six feet broad and about seven in height, with a passage into it just ample enough for a good sized man to enter. There was no royal road to safety; no means of isolating this interesting quarter from the chances of danger. Sunken as it was, bringing its roof only a few feet above the level of the trench, and protected by traverses and parapets, splinters of shells and large shot were lying in its environs in dismal corroboration of the fact that the siege was no respecter of persons nor recognised any spot as entitled to the privilege of escape.

Seeing a collection of gabions idle, some French soldiers of the 20th and 27th regiments of the line, carried off about a hundred from the store and broke them up for firewood. Private Calderwood in charge of them, failing to make his bad French understood, remonstrated with the depredators by an extravagant display of gesture and grimace. The allies were humorous and treated the appeal of the irate sapper with more risibility than was agreeable. Lieutenant Darrah of the engineers appearing, he spoke of the abstraction to one of their officers, telling him the gabions were British property; and as if to add weight to his assertion, pointed out the unarmed soldier who had charge of them. Without attempting to excuse the appropriation, the French officer shrugging his shoulders, merely observed, that as the sapper had no carbine to show the nature of his authority, he could not be regarded as a sentinel; and so the gabions were borne away to cook French soup!

Next night 2 privates and 50 of the line were deputed to the right advance of the Gordon attack, who, in the face of light-balls and grape, staked no less than 79 gabions. Under the circumstances this was a feat in war. Nevertheless, from the

briskness of the fire, there was an unwillingness to continue the sap, and the private in charge withdrew the party for a time to the left advanced trench, reporting the arrangement to Lieutenant Graham, who indisposed to spare the labour of a moment from the work, repaired himself to the spot. No sooner had he and the sapper arrived, than a shot bounded before them, and scattering the stones with great force, wounded Lieutenant Graham so severely that the trenches for a while were deprived of his services. The fire on the party in its new position, being still unrelaxed, the line-officer who commanded felt it his duty to take his men away, telling the sapper left in charge, that he regarded the place too perilous for line-men to work in. Inferentially, it was not too dangerous for sappers; but as a solitary individual could not hope to do much in so exposed a situation, he was removed by the assistant-engineer, Captain Wolseley, 90th regiment, to other work in the foremost trenches. Private Bernard Murray was this night wounded in the right hand, and next day privates James Mehan in the right ankle and Peter McNulty slightly by rifle bullets. The last had done good service in repairing an embrasure under fire at the request of a naval officer; and besides being in brigade orders for his conduct was given a donation by Lord Raglan.

On the night of the 10th, 18 sappers provided for the Gordon attack were told off to the following works under Captain Cooke of the engineers and Major Campbell, 46th, assistant-engineer:—

Sappers. Men

- | | |
|---|--|
| 3 | 200—new trench in front of No. 18 battery; placed and filled 143 gabions. |
| 1 | 38—building 18 battery. |
| 1 | 41—building traverses in 19 battery, and trenching an approach to it. |
| 1 | 21—carrying platforms. |
| 2 | 50—left advanced trench; placed and filled 14 gabions and improved old part of trench. |
| 2 | 80—right advanced trench; placed and filled 42 gabions, and connected the cutting with end of new wall. |
| 4 | 60—wall in continuation of right advanced trench; built it up four feet high and two feet six inches thick, grape proof. |
| 3 | 20—turning the advanced Russian trench into a parallel, in which considerable progress was made. |
| 1 | 20—excavating for small arm ammunition magazine and engineer |

The above detail, taken with all its precision from the diary of the siege, may be regarded as the type of employment and distribution of the sappers at this era of the struggle.

About this time was finished No. 15 mortar battery in the third parallel. It was commenced on the 24th June, under the foremanship of second-corporal James Hill, who since the middle of May had been employed as one of Major Bent's permanent day overseers. The way to it, from No. 14 battery, was driven through rock when occurred a good stiff clayey soil, upon which the new formation was founded. Wholly built of earth accessible at the spot, without a single sand-bag to assist its solidity, it was reckoned to be the boldest construction on the left attack. Stretching along the trench for 200 feet, with a parapet about 10 feet deep and 26 to 30 broad, it covered an armament of twelve 10-inch mortars, which were fed from three strong magazines and a shell-room. Free from the annoyance of cross-fires, there were no traverses in the work; and it was remarkable that during its progress only three shells pitched into it in day-time. One killed a line-man at the mouth of a magazine, another burst in the distance, and the third passed between Major Bent and the corporal. It was near enough to be alarming, but both were instantly prostrate, and on exploding the splinters flew high above them. When the battery opened fire, the earth shook down in various places, especially at the angles; to remedy which powder-barrels were added to the revetment. No work perhaps throughout the siege cost less labour in repairs and less casualties than No. 15 battery.

On the 14th July was commenced the fifth parallel of the Gordon attack on most intricate ground. The pioneers were horribly exposed to a cannonading from the Redan, Garden batteries, and Bastion du Mât. Hours of dogged labour failed to show an excavation which was worth the trouble of calculating its dimensions. Earth was collected with as much care as flour in a famine and brought on men's shoulders from a distance to give quality to the cover. Every stone dislodged by the miners, treasured as if it possessed intrinsic value, was pitched into the gabion or added to the parapet behind. Upon

the tier of gabions forming the revetment, sand-bags were laid in courses as fast as they could be delivered by the line. The trials of this foremost work were incalculable; the placement of every gabion was opposed, and every inch of progress furnished its obstacles. On one occasion several of the baskets were thrown down and not a few were broken and rendered useless. Difficult to labour under such circumstances, most of the working party were withdrawn; but all the breaches nevertheless were made good before the morning at a cost of two sappers and six of the line wounded.

Blanched bones buried for years in the Russian cemetery turned up in the excavations, took their places in the parapets with blocks of rock, broken tombstones, shattered coffins, and consecrated earth. It was not a time to care about memories, or removing marks fixed with hallowed care to point out the sites of favoured remains, but an innate feeling of reverence for the dead prevented the sappers and workmen, as much as in them lay, from disturbing the dread repositories of the dead or defacing the memorials, rude as many of them were, which filled the graveyard with melancholy records of the departed. This consideration for the relics of poor humanity did not produce among the workmen any false sentiment with regard to the living; and on every side powerful works and engineering stratagems were in operation to weaken the vigour and hauteur of a brave but insolent enemy.

Ceaseless perseverance drove on the works and sustained valour kept the men at their posts. One trench after another was added to the vast net-work of defences, which, crowding on the edges of the hills, descended the valleys as if pushed down by some capillary law. In this way the glens were crossed more than twice with saps. New approaches were thrown out in front like so many antennæ striving to clutch the enemy's works. Still the progress was slow, for the oolitic rocks out of which the hills were formed obtruded everywhere, defying from their hardness all arts but those of blasting. Rifle-pits on the right were constructed on the very rim of the hill in front of the fourth parallel, to which they were connected and each to the

other by long zigzags and passages. One built in a secluded nook or gorge commanded the chevaux-de-frise which stretched across the Woronzoff road. About this time the use of hay-band hurdles was resorted to with fair success as screens to the embrasures, to cover the artillerists at the guns. The pressure in front for materials caused some of the field-battlements in the rear to be dismantled, and the stores and armaments to be employed in the new works, while a few coopers augmented the stock by recovering the staves of broken casks and rehooping them with iron.

So well, indeed, were the extensive and complicated requirements of the siege attended to, that Major-General Jones, a close observer of the exertions of his force, commended it in these encouraging words on the 16th July. "The officers of engineers and the men of the royal sappers and miners continue to perform their duties in a very zealous manner." None flinched, none evaded his allotted labour; but many, from the "great heat of the trenches," and the constant recurrence of a hard and fatiguing duty, were worn out or laid up and consumed by fevers. Truly wasting was the season, very light breezes only being astir to mitigate its oppressiveness. Strong hot winds at times, and heavy thunderstorms with frightful lightning playing above in angry forks or blazing sheets, told of its sultriness. Genial showers, however, now and again occurred to relieve it, which had the effect, in some degree, of refreshing the men, and giving an inspiring spur to the flagging energies of over-tasked industry.

1855

17th July—25th August.

SIEGE OF SEBASTOPOL.

Trials in carrying on the works—Fifth parallel, right attack—Detachments and statistics—Spirited conduct of corporal Ross—Neglect of non-commissioned officers—Trench dress of the line—Shifts of the miners to form the parallels and approaches—Siege minutes—Trenches flooded—A sergeant, in the absence of an engineer officer, in charge of the lines—Casualties—Sortie by the Russians—Sergeant Docherty examines the chevaux-de-frise—Overseers of the miners—The carpenters—Renewal of the chevaux-de-frise demolished in the sortie—Casualties during a moonlight night—Exertions of sergeant Jarvis and party; the sailors—Strange sensation produced by the blow of a shell splinter—Resources for field-work purposes—Progress of the trenches and batteries—Removal of the right attack sappers to the camp of the left attack—They thus escape a subsequent catastrophe—Fifth bombardment—Cost of a whiff of tobacco—Activity of the sappers in the batteries and works—Anecdote of a new comer visiting the works—No. 17 battery, left attack—Corporal Jenkins, the master carpenter of the left attack—The white-banded cap—Fifth parallel, right attack—Breaking ground from it for the last approach to the Redan—Workmanlike industry and vigour of corporal Ross in the sap—Corporal William Baker, 7th company—Progress in the advanced trenches; sergeant Hale of the guards; corporal Stanton—Prolongation of fifth parallel, right attack—Effects of wounds.

In the trenches were distributed, on the 17th July, a working party of 550 men superintended by 97 sappers. Of the latter, 73 were on the left where the mines demanded the skilled employment of men used to blasting. Several carpenters were detailed to the platforms and magazines, and others were sprinkled singly to the different works, embrasures and traverses. The majority were in advance prolonging the parallels and blowing up the rock. On the right attack, corporal George Luke was killed. A first-class miner and sapper, he was of

signal service in the trenches, and his steady conduct throughout the siege added to the credit he had received for his exertions at Bomarsund.

In the night an old Russian trench, which by degrees had been reversed, was connected with the fifth parallel on the right attack by 11 sappers and 200 men, while 4 of the corps and 100 linesmen joined the approach from the left of No. 19 battery to the fourth parallel. These junctions were both effected under Lieutenant Brine of the engineers. Of the fifth parallel, a moiety was formed wholly of rubble masonry. Lacking gabions and revetting materials, the stones thrown up in blasting were the readiest means of forming the parapet. This rubble mound, forming a line of trench for about 450 feet, and stretching along the brow of the hill to the left of a hollow in the rock, which had acquired in official description the designation of the "little ravine," was completed and backed in with earth by the 28th July. Being so near the enemy's works, and disturbed by daily showers of grape, shell, &c., the construction of this stone parapet formed one of the curiosities of the siege.

Both attacks were hourly approaching nearer to those extraordinary structures it was hoped every day to storm. It still required time to render the preparations complete for the dénouement. The ever present rock, covered only by a few inches of soil, greatly increased the trials of the workmen. Sacrifices of energy and strength were made in its removal that ended in casualties unknown in former wars. The siege was one continuous battle; yet it was more than strange, considering the ferocity of the cannonade, that comparatively so few casualties occurred. Engines to destroy human life in the most approved methods were complete among the Russians; still they did not scruple to resort to the uncivilized use of horse-shoes and scrap-iron to mow down the assailants. So close were the parallels to the enemy's works, that, on a clear day, a finger could easily be discovered above the parapet. Where the cover was scanty, it was a virtue to double up one-self into a cramped position and labour like a giant. The miners and sappers in every contortion of body, wheedled themselves under cover and stole on-

wards with insidious certainty ; but to preserve a strict concealment was not an easy matter. For ambitious men the times were tempting ; opportunities seemed to impel one forward, or to unbend one-self into an erect posture in delivering a blow ; for, intent on progress, the mind forgot dangers, and it was just then that the ardent man let his head or his arm appear above the parapet, or his leg stray beyond the last pitched gabion, when he was struck down. It was different, however, at night, when all were alike veiled by the darkness. Works then were commonly prosecuted on the open in front of batteries, on the tops of merlons and magazines, and the crests of parapets. Experienced sappers after dusk seldom sought to shield themselves by the sap-roller or mantlet. A check to their progress, it was almost always cast aside to be used by men who feared to go ahead without it.

Private Rowland Nicholas was struck severely in the right foot while working in the fifth parallel of the right attack, and died of his wounds. The firing was more true than severe and eight casualties occurred in this parallel during the night.

There were nine companies in the Crimea on the 21st July, each of reduced strength, giving a total of 678 sergeants and rank and file. Of these there were 97 detailed to the following places :—

	Sergts.	Corporals.	Bng	Privates.	Total.
St. Paul near Kertch	0	2	0	12	14
Scutari	2	3	0	21	26
Balaklava	2	6	0	22	30
The monastery	0	0	0	2	2
Telegraph stations	1	1	2	10	14
Head-quarters of the army	1	2	0	8	11
					—
Otherwise employed, and as batmen	5	0	1	33	39
					—
Total					136

At St. Paul the detachment conjoined with the French and Turks in raising defences for the protection of the post. The men at Scutari attended to the artificers' work in the hospitals and barracks, many being foremen, and sergeant William

Sargent overseer. This non-commissioned officer was soon after discharged and appointed civil foreman of works at that great invalid depôt. Corporal Rinhy was the military foreman, and a most energetic and useful man he was found. Other non-commissioned officers were detached to the hospital-stations on the Bosphorus as overseers. Sergeant Barnard was at Pera, sergeant Lynn at Kulalec, corporal Cann at Ismid,¹ and corporal J. T. Collins, after leaving the trenches in consequence of his wound, was appointed sapper superintendent in the island of Proti, where the Russian prisoners were confined, and for whose accommodation huts were erected and an old Greek monastery converted into an hospital. At Balaklava the detachment superintended the removal and erection of the huts at the camp and elsewhere, and fulfilled various duties in relation to the stores, wharves, and defences; while the party at the monastery and with the telegraph were busy in carrying out the details of that interesting field adjunct. Those at headquarters were employed in offices and as orderlies. Sappers were appointed batmen from the impossibility of retaining civil servants with the officers, and thus a rule had been broken, which for forty-four years had been adhered to without infringement. Of the remaining number on the rolls, there were 90 men sick in camp, and 59 dispersed in invalid ships and in the hospitals on the Bosphorus. Taking all these details into account, there were only 393 fighting-men left for trench-work, which will at once show how hard must have been the duties of that half-battalion. As, moreover, there were other indispensable services in camp which could not be relinquished, it followed that the usual routine of the companies necessarily appointed the same men to the trenches every other day or intervening night; and this, continued without intermission for months, amid varying vicissitudes of weather, of fearful exposure and untold hardships and suffering, gives an aspect of

¹ Corporal Cann continued at Ismid till May, 1856, when the troops were withdrawn. "He had for the last few months sole charge and direction of the various works required at that station, and fulfilled that charge in a most satisfactory manner." Such was the report of Major E. C. A. Gordon, of the engineers.

sapper character and endurance which few will be slow to eulogize. Indeed several of the non-commissioned officers charged with particular services, were every day in the trenches and sometimes even at night. Nor should it be omitted to observe that the extreme heat of the season had so enervated the men, that none but the most acclimatized and inured to fatigue could bear up against its exhausting influence. Thinned, therefore, by disease, hard work, long vigils, and night damps in the trenches and mines, the numbers of the sick fluctuated to such an extent, that the proportion above stated was at times considerably overshot. The reinforcements which arrived from England to fill up the places of casualties almost to a man fell sick from these causes, and many wanting sinew and hardihood were removed as invalids from the camp without seeing the trenches.

There were some works in the advance which required a nice appreciation of intention on the part of the operatives to carry them into effect. Of these the connection of an approach with a parallel, and one trench with another, were among those which called for particular circumspection. Expert men were invariably selected for those duties, whose wariness greatly mitigated their risks. Few appeared to be more skilful in these employments than their comrades, but on the night of the 21st, corporal John Ross, untiring, patient, and intrepid, pushed on like a master in the sap, and connected, under showers of grape, enough to disturb the equanimity of the sternest coolness, the fourth parallel with an old Russian rifle-pit in front. It will help to elucidate the business of a sapper to describe the process by which the corporal accomplished this service. With 200 men and a couple of privates of his own corps, he was sent forward, after dark, to trace and form an approach between the fourth parallel and the Russian advanced trench. Halting his men in the parallel, each bearing an intrenching tool and a gabion, he moved to the front with his two sappers and traced the zig-zag. Without losing a moment he returned to the party, and to prevent confusion, led them from the trench in single file. As each man arrived at his place, one sapper

staked the gabion, and the other instructed the workman with respect to the space to be left for a berm and how to act in forming the parapet. So pushed on the line of gabions, till the end one touching the rifle-pit, approached within forty yards of the Russian trench. All the way the ground was solid rock. To make up for this disadvantage the corporal sent to the depôt for baskets and had the earth brought up a distance of sixty or seventy yards. So spiritedly was everything done through his own laborious example, that the gabions were not only filled but cover sufficient was obtained for the miners to work in the approach the next day. To a brisk musketry fire the party was exposed the whole time, but the darkness of the night favoured the exertions of the corporal and his men, and they left the boyau without casualty. Corporal Ross's conduct in effecting the junction was noticed in brigade orders, and considered so deserving of reward that General Simpson ordered him to be paid a gratuity of two pounds. Private James Lacy of the ninth company was also noticed for his zeal in the work.

Next day private Nathaniel Gillard, a rough but hardy miner, was killed in the advance trenches on the right attack.

While no instance of applause in which the merits of the men are concerned have been omitted, it would be unfair to hide any indiscretions which may have subjected any of them to censure. Those pages would be incomplete if commendable deeds only were paraded and the objectionable ones suppressed. Well is it, however, that no case of cowardice has occurred in our ranks, although instances of natural timidity were sometimes discovered. Neglect in the trenches amount to offences among the sappers which in other corps would not be entitled to more than ordinary notice. A flagrant instance occurred on the night of the 22nd July. Very little work was done though the party was large. A sharp fire was maintained upon the linesmen which made it difficult to keep them to their tasks. Greatly as this may have operated in retarding the works, the indolence of the workmen was chiefly attributable to the carelessness of the non-commissioned officers of sappers in charge,

who added to their heedlessness a disregard of orders repeatedly given them. Lying down in the trenches, the parties idled away their hours under the apparent sanction of the overseers, and the names of three non-commissioned officers seemingly unimpressed with the importance of their responsibility, were mentioned to General Simpson.

On the 25th the linesmen appeared in the trenches in a brown linen fatigue suit, like so many storehousemen from a sugar refining establishment. Unrestrained by stout cloth and tight sleeves they worked with obvious energy. This novel dress had also the advantage of enabling the engineer to distinguish the workmen at a glance from the guard of the trenches, and of assisting the sappers to look after their parties and prevent attempts at straying or shirking.

On the left three more rifle-pits were sunk in sheltered spots to command positions from which danger threatened. In broad daylight the blasters carried out their duties in the communication leading to the French picket near the cemetery. Many sappers were pushed into the foremost trenches of both attacks, who blew out the rock with a spirit that suffered no abatement, though the same men for many successive days had given their exertions in removing impediments which nothing but mining could reduce. Impossible to get earth in those difficult trenches, it was even scraped from the face of the rock, and picked out of crevices and indentations in which the sweeping wind or the rushing torrent had lodged it. Soil carried from the rear was husbanded in diminutive heaps, and shovelled at night on the incipient works. Clay also was gathered for the purpose and borne in baskets to the front. Walls of loose stones were formed in short lengths along the different traces to protect the sappers in their progress. Without this temporary expedient they could not have advanced. Where their lives were imminently imperilled, the trench was not thrown forward by day, but was simply deepened or widened by numerous small explosions. The boulders and stones thus loosened were worked unsquared into the parapets at dark, and all vacuities stuffed with clay or earth. So

effectual were the efforts of the blasters, it was ascertained that one sapper in daylight upheaved enough rock to occupy nine men for four hours at night in giving it a lodgment in the parapet.

In the valleys the besiegers had penetrated to some old walls and crazy structures, which formed the buildings of a wild and scattered suburb. All these were made to serve their uses, either as parts of the trenches, or in furnishing materials for platforms and magazines. A few brigades of carpenters having the run of the batteries, took pride in the efficiency of their labours. In the front parallels sand-bag loop-holes, and others of wooden troughs after the Russian fashion, were built to scour the ravines. The latter never obtained favour with the British riflemen, because the smoke moved lazily from the tubes and precluded the chances of seeing the effect of the fire. Shot-holes were plugged up in all the parapets, and breaches mended in places of arms. Unfinished works, and embrasures ruptured by the enemy's shot and shells, necessitated considerable attention; but as revetting materials had reached their utmost limit of scarcity, the Turks and Sardinians helped by their labours to meet the deficiency. Gabions made by the former were slack and rickety, fit only for secondary uses, while those put out of hand by the Sardinians were everything that could be desired. New batteries with ample magazines were formed on rocky sites and others powerfully enlarged. No. 18 battery, on the right attack, was armed on the morning of the 26th July with seven 13-inch mortars, three of them being sea-service ones. The work spread out in great length in the first demi-parallel, nearly to the crest of the middle ravine. Some of the earliest batteries wore an appearance of age and even permanence, for spots of scanty verdure grew upon their slopes, and rank herbelets sprang from shot-rents and seams. The soil had solidified, and tearing shells had less effect upon them than younger constructions; still the repairs they needed were generally of some magnitude, because they were assailed by the heaviest ordnance, of the largest calibres and weightiest missiles. For several days heavy showers diversified the ob-

stacles of progress and attack. Fortunately the works suffered little, but some of the low parts of the trenches were flooded. The increase of mud, deep as it was, was barely regarded as a difficulty, although every tramp buried the leg to the swell and played annoying pranks with boots and shoes inadequately secured with thongs or laces. This was far from pleasant, and consequently efforts to avoid the pools were carried to an extravagant pitch by many, who, sooner than soil a badly-polished boot or drizzle in mire the legs of an old pair of trousers, risked their lives by mounting the reverse of the trench in passing to their duties. All these discomforts were however speedily relieved, and eventually in great part removed, by cutting tunnels through the rock and forming channels by chisel and jumper along its face.

On the 28th at night, Major Campbell of the 46th regiment, assistant engineer, was wounded in the back and obliged to retire from the right attack. Sergeant Philip Morant succeeding him, it fell to his lot to distribute the working parties to their several duties and control their services until the day relief. It also happened on the 30th, from some miscarriage of arrangement, that sergeant Docherty, by order of Major Bent, was placed in charge of the workmen on the left attack. For the day he stood in the place of an engineer and kept his widely-spread parties in full activity. These are the only instances during the siege in which non-commissioned officers of the corps held positions of unusual responsibility.

Casualties from splinters of shells and flying stones, from cohornes in the Redan, and heavy shells and carcasses discharged from the collateral works were very great. Those which occurred among the sappers from the 23rd to the end of July were as follows:—

Day 23rd—Colour-sergeant Alexander M. McLeod, slightly wounded in the right breast. This was his second wound, having been struck in the head on the 6th June.

Day 25th—Private Alfred Rowlett—killed on the right attack.

Night 25th—Private John Miller—killed on the left attack. Was struck by the splinter of a shell, which carried away part of his head
& was superintending 20 men employed in repairing damages

done by the Russian fire to the central boyau leading to the fifth parallel.

Day 26th—Lance-corporal Richard Pinch—slightly wounded by the bursting of a shell, while at work in the fourth parallel, left attack.

Night 26th—Private James Drummond—dangerously wounded on the right. It was excessively light during the night. Grape and shell swept over the trenches, and one of the latter on bursting broke his thigh. He died of his wounds.

Night 27th—Private Francis Collins—wounded in right thigh—right attack.

Night 27th—Private Roderick Stewart—wounded in right side—right attack.

Night 28th—Private Alexander Sparks—wounded slightly in the neck in the right advance trenches.

Day 29th—Private Robert Sharp—severely wounded in right leg, by the splinter of a shell, while cutting the shell-room in No. 17 battery, left attack.

Entertaining a predilection for sorties, the Russians attempted an attack on the night of the 2nd August, sending forth a small force to feel the way, intending, if access were readily attainable, to rush upon the quarries with powerful columns. Driving up the Woronzoff ravine, the enemy was brought to a stand by the iron chevaux-de-frise which crossed the valley and blocked up the road. Confused movements and the clanging of arms was heard by the British picket in the ravine, who, thus put on their guard, opposed the assailants with volleys of musketry, from which the Russians turned and ran into their works, leaving, however, the impress of their perseverance in the partial destruction of the chevaux-de-frise. During the sortie the fire by the besieged upon the right demi-parallel was very fierce. Five sappers and 45 men, altering its direction from a curvilinear trench to a straight one, held unflinchingly by their tasks and acquired much credit for their labours. Lance-corporal John Miller was killed on the right attack.

Sergeant Docherty went into the ravine after the Russians had retired to ascertain the extent of the damage. He passed along the entire length of the barricade. The centre was embedded in sand washed down by heavy rains. As it could not be readily dislocated, its spikes were stricken off by the enemy at the axis. Most of the chains which connected the tubes were wrenched from their staples, the flank pieces drawn aside, and gaps at intervals occurred along the line. There were

only seven portions of the chevaux-de-frise left in a serviceable state, and such of the other tubes and spears as could not be borne away in the flight were broken with sledge hammers and scattered in fragments to wide distances over the ground. The sergeant's little episode was not without its risks; for the ground was dangerous and the enemy's picket-house near. While Docherty was busy ascertaining the extent of the demolition, the moon rose brightly above and he was perceived. One bullet after another whizzed in his direction and two of them perforated his greatcoat, but he cleverly eluded the Russian riflemen by creeping up a rut in the side of the ravine, which worn away by storm-flows, was sufficiently deep to cover him. On returning to the trenches he reported the result of his reconnaissance to the assistant engineer on duty, Lieutenant Jones of the 46th regiment.

Next day there were 97 sappers in the trenches of the left attack principally occupied in blasting hard ground in the advance saps. With the aid of line quarrymen, there were turned into the parallels at least 80 blasters at every relief. The non-commissioned officers superintending the miners on the 4th August were noticed in the official journal. Their names are here preserved, having as overseers superintended the formation of works which in after time, looking at the danger and extreme difficulty of their execution, may doubtlessly be held up as examples of extraordinary toil. These were second-corporals Robert Hanson, John Paul, and James Hill, all of whom received promotion for "conducting operations of the siege entrusted to them with ability and perseverance whilst under a constant heavy fire." Speaking of the first Colonel Gordon of the engineers acknowledged, under date the 6th December, that he was one of the "most distinguished in the corps for bravery, and had just received a step of rank"—that of corporal—"for very distinguished service in the field." This eulogium had reference to his intrepid services on the left attack, from the beginning of May to the end of the siege, in conducting the blasting operations for forming the fourth and fifth parallels from the double sap to the cemetery.

Hanson was an indefatigable man, uniting to a strong frame vigour of purpose and great energy, which led to his selection by Major Bent to be one of his standing overseers. Boring rock was a tedious and uninteresting sort of employment. It chafed many a brave spirit, who would have preferred the rash hazards of assault to the plodding exertions and quiet discretion of a resigned miner. Besides its hard difficulties it was attended with perpetual risks. The ringing of hammers on the jumpers boring the rock, and the rising clouds of smoke from the blasts, gave indications so certain that projectiles of all kinds, from the invisible Minié bullet to the raging shell, were directed against the quarriers. So greatly exposed were these parallels, especially on the crest of the ravine and in driving down its broken side, that the casualties were excessive. Still, though the working of them was one continued adventure, Hanson moving among his parties early and late, day after day without missing a tour, was never touched!

So extensive now was the work for carpenters in the front it was found necessary to break in upon the routine of the rollster and send them irrespective of any assumed periods of relief to the trenches. Even those of the corps employed in the parks were added to the skilled resources of the engineers in both attacks. Magazines and platforms required repairs in every battery and new huts were wanted for doctors. Little clusters of these craftsmen were told off to every work, and without making a marvel of their exertions it is not the less creditable to say that their perseverance and quickness under the superintendence of non-commissioned officers who were citizens of the trenches, were, if not astonishing, highly satisfactory.

The chevaux-de-frise demolished on the 2nd, which left a clear passage for a sortie of between 45 and 50 yards, was almost made good in one night by a few sapper blacksmiths, under a direct fire of Miniés, shells, and grape. More would have been accomplished, but it was found an intricate matter in the dark to felloe the iron fitments. Next night two of the men repaired to the ravine to finish the barricade, but unable to procure help from the guard of the trenches, the moon rose

upon them before the gap was filled up, and it was left for a subsequent night to complete the junction.

In the night of the 4th the moon again was up, and undimmed by mist or cloud, shone brightly over the trenches, telling our secrets to the Russians ensconced in concealed pits. Harassed in their work, the workmen in the fifth parallel of the right attack were withdrawn to less open trenches. The firing upon Nos 17 and 20 batteries was very warm and the casualties heavy. The line officer in charge was dangerously injured, and between 20 and 30 other accidents occurred, among whom were a corporal and two sappers slightly wounded.

On the 6th August sergeant George Jarvis, a useful and pushing overseer and accredited to be one of the most competent, gallant, and go-ahead sergeants of the left attack, held a roving superintendence with a party of 54 men of the 68th regiment and 4 sappers. With broken stones they filled up the shot holes and craters in the second, third, and fourth parallels, and also collected loosened rock in heaps to be worked into the parapets at night. Sand-bags and gabions at this time were very scarce. In some works they could not be had. The latter, heavy with wet and bulged and rickety by pressure and hard service, were nevertheless made to do duty in the front, intermixed with gabions woven with the iron hoops of broken barrels. These, with beef casks, worn tubs, and fascines tied with rope-yarn, strips of hide or iron bands, were the staple of the new constructions; and bread or biscuit bags, laid with gingerly care, formed faces to the revetments, backed by blocks of rock rolled into the parapets by manual labour. Even coal-sacks, heavy as they were when filled with earth, were found to be useful auxiliaries to the sand-bags. With singular abnegation the stalwart sailors incended their own embrasures, supervised by a few of the old sappers; and in driving some new communications gave material help, overriding by their strange but energetic combinations and procedure the more orderly but less picturesque efforts of disciplined troops.

On the 8th, though a storm broke over the trenches, choking up the channels and beating down the parapets, the

men still worked. Many casualties were counted in the advance saps that day, two of whom were sappers—privates Matthew Hall wounded in the head, and John Fraser in the face, both slightly.

In the following night, the play of cohorn shells was more grand and vivid than hurtful. As many as sixteen of these missiles were screaming in the air at one time, marking their vicious courses through the darkness by a continuous burst of fire. Several of them pitched in the unfinished portions of the fifth parallel of the right attack, where parties of sappers and some men of the 31st regiment were busy reversing an old Russian trench. Corporal Curgenvén, who was in charge, seeing no absolute shelter anywhere hugged the parapet closely, as did also a sergeant and an officer of the 31st who fell in line behind the corporal. Just then a shell burst above, scattering its splinters without apparently touching any one. "Are you hit, corporal?" asked the sergeant. "Not I," said Curgenvén, cheerfully. "Depend upon it you are," returned the sergeant, "for a fragment fell so near you, I wonder you are alive to say you escaped." When about to withdraw from the parapet, the corporal felt so heavy a weight on his hand, he fancied a portion of the revetment must be bearing on it. He was soon undeceived. A splinter had struck him, benumbing the limb to such an extent that the sensation produced was one of overpowering pressure. After satisfying himself that no bones were broken, and binding up his hand which was bleeding and much swollen, he resumed work as if nothing had transpired to cause him a moment's uneasiness.

It was a hard matter when grape showered among the parties to keep them at their tasks. From this cause in the same night very little progress was made. An unarmed detachment appointed to cut a drain to the front on the left of the fourth parallel of the right attack wavered in its performance notwithstanding the personal risks and labours of the sapper in charge to win their firmness and zeal. At daybreak on the 11th sergeant Jarvis was again the chief sapper superintendent on the left, and with a force of sixty linesmen attended to the

general drainage of the trenches. In the following night forty men were employed clearing loosened rock in the fifth parallel and building traverses. This party, under corporal Cray, whose constant faithfulness and ardour secured him many commendations, worked exceedingly well. On the 12th there were ninety-eight sappers mostly miners, boring and blasting in the fourth and fifth parallels. This was the largest force of sappers in the trenches of either attack at one time, except on the 3rd March, the first night of breaking ground for No. 7 battery of the left attack. At midnight on the 14th, twenty-five men in charge of a corporal of sappers, extending the fifth parallel of the right attack to the white Russian rifle pit, were opposed by shells and shot, which breaking the rock threw the stones into the gabions; but one striking more effectually tore up the last-pitched gabion and dashing it at the corporal knocked him down. Next day private Alexander Weir, a strong and pushing miner, was killed on the left attack; and in the succeeding night sergeant William Wilson on the right attack was entrusted with raising from the trace a 2-gun battery (No. 21) to enfilade the right face of the Redan. It was built on the right central boyau leading to the fourth parallel.

By the middle of August the whole sapper force on the right was removed to the royal engineer camp on the left attack. In the former camp they held a forward position on the extreme right of the light division, and next to them on their left were the rifles. From high elevations shot and shells sometimes dropped in their vicinity, and one plunging furiously into the tent of sergeant-major Pringle shattered the table at which he was writing, and driving through a box of clothes and comforts buried itself in the earth. The startled occupant escaped, but in the violent overturning of his table and chair he was knocked down.^a

^a The concentration of the companies on the left, proved to be very fortunate, for they escaped a terrible catastrophe. The ground vacated by them was soon after occupied by the artillery and small arm brigade. When the explosion of the French magazines in the Ravin du Carénage took place in November, 1855, the shock, chiefly felt by the artillery, resulted in a loss to that regiment of 52 killed and wounded out of a roll of casualties numbering

On the morning of the 16th the Russians attempted a sortie, but before they had proceeded far up the Woronzoff road were compelled to retire followed by a sharp fire which accelerated their retreat. This was succeeded on the 17th, as soon as day broke, by the English and French opening their batteries for the fifth bombardment with a sweeping fire upon the whole range of the enemy's works. In the early part of the day the cannonading was frightfully brisk: on both sides it was accurate; but as the hours wore on, the Russian batteries, crumbling into useless shapes, no longer able to cover the artillerymen at the guns, fell off by degrees in fierceness till the intervals became so long, it seemed as if the silence was the solemn consequence of the slaughter. In several places the parapets were so ploughed up and shaken, that, tumbling into the ditches, wide breaches were exhibited which clearly told of the ravages committed by shot and shell. It would indeed have been remarkable had not the destruction been excessive, for the guns and mortars playing from the British batteries alone were 187. In the right attack there were 20 batteries, but only 19 in action. The great 21-gun battery, early the terror of the siege, now shorn of its strength, was more than rivalled by No. 16 battery which had 14 pieces of artillery at work. The first eight batteries too distant for a striking cannonade only counted 18 pieces of artillery among them. On the left attack the batteries were numbered up to 17, but of these 5 and 6 were defunct, the materials composing them having been employed in more recent constructions. In No. 1 battery there were 13 guns and mortars, and in 14 and 15, 11 each. The English formations suffered but little comparatively and only five guns were disabled and a few carriages shattered. From our own sharp fire many of the embrasures were injured in the necks; and in the old batteries there was a general tottering which occasioned much labour to prop them up for battle. Nos. 7 and 8 were the most unstable and beaten.

146 of all ranks. The engineer park took fire at the time, but not a sapper
w r e s t

The turgent sand-bags and the worn-out gabions, alternately wet from violent rains and dry from the charring heat of the sun, burst and broke up at every blow. A couple of 13-inch shells struck two platforms in No. 14 battery of the Chapman attack and tore them from the sleepers. Shocks of shot and pieces of shells shivered some timbers in different works, and in others drew the bolts which held them in their places. Three shells one after another exploded on a magazine in No. 8 battery left attack, breaking the roof and starting the frame. The smoke still hovered over the spot when lance-corporal Jenkins with that spirited readiness for which he was remarkable, entered the place to ascertain the extent of the injury. It was of a nature to require the instant removal of the powder, in which Jenkins assisted, and by the next morning the damage was made good and the powder replaced. On the right there were 28 sappers in the batteries who were relieved in the afternoon by 36 of the corps. Their duties were those which arose out of superintendence and the platforms. On No. 14 battery of the Gordon attack, the firing had told so destructively that two of the embrasures were in ruins. As sappers could not be had in the work to effect the restoration, the naval captain in command of the seamen gunners telegraphed to the rear for a reinforcement. A few able fellows were hurried to the battery, who at once commenced and continued through the heat of the bombardment to remove the debris which choked up the openings and to rebuild the cheeks with gabions and fascines handed to them by the willing sailors. It was an exciting sight to watch the firmness and exertions of privates David Boyd and George Harvey in one of the embrasures, who remained at their posts till the renewal was finished; and when, after risking perils with fearless indifference, they leaped from the opening, the admiring seamen welcomed their escape with cheers. Privates Allan Hay, Alexander Norval, and William Robertson, also acted with firmness in mending the embrasures of No. 9 battery of the same attack; and Lieutenant Brine, the officer of engineers on duty, reported that the five men just named "displayed great courage and energy in repair-

ing embrasures and clearing them out under fire." On the left no working party was employed, but three sappers opened an embrasure in No. 1 battery; 20 posted in front of No. 7 improved its cover; 30 in No. 16 built the terreplein, and six carpenters with saws, chisels, and bags of bolts and nails traversed the batteries to make repairs wherever emergency called for their services. The general casualties in the day's bombardment were severe. Of the sappers two were killed and five wounded, viz.:—

Left attack.—Private Henry Masters—killed; a round shot carried away the top of his head. He had been wounded in the trenches on the 14th March.

Right attack.—Private William R. Collings—killed.

2nd corporal Harry B. Smith—wounded severely in right leg.

Lance-corporal Edward McGinn—wounded severely in the back.

Lance-corporal Joseph Finch—wounded slightly in right knee.

Private John Delany—wounded slightly in the face.

Private John Lloyd—wounded slightly in right leg.

Collings, Smith, McGinn, Delany, and Finch, had been repairing platforms on the left of the second parallel, which being in a serviceable condition, they thought to relieve the suspense of the temporary leisure with a whiff of tobacco. Lighting their pipes they had scarcely begun to feel the comfort of the luxury when a shell bursting knocked down the whole of them. Collings struck in the heart fell dead and a second shell tearing through the parapet buried the lifeless man under a pile of earth and stones. McGinn for a time was ignorant of the injury he had received and was only made conscious of it by feeling a weight at his back and strange sensations of fainting.

Next night the sappers were mainly employed repairing the different batteries and filling up shot-holes and gaps in the parapets and revetments. An incessant musketry fire followed them wherever they went, but the shelling was unimportant. On the left attack, private Lancaster had charge of the work in the double sap. He had with him seven men of the 9th regiment, and another party was employed in the rear filling sandbags to permit the advance to proceed unchecked. As

these were brought to the front, the linesmen assisted Lancaster to throw the earth over the parapet and also to load some biscuit bags for the purpose of superadding them to the revetment. While filling one of the bags a shell plunged among the party and with its splinters killed two and wounded five. Lancaster strangely enough escaped. He threw himself down at the instant close to the half-filled bag, and when the shell burst he was only stunned. As soon as he had recovered himself and saw the havoc committed among his assistants, he went into the parallel for help; and on returning received a slight bayonet thrust from one of a party of men who in haste were retreating from the rear of the sap. The whole of the workmen laboured through the darkness with praiseworthy activity, especially the parties under corporals Cray^a and McEachran, to whom much credit was given for their exertions and example in coolly entering the broken embrasures and replacing the damaged gabions and sandbags with old powder barrels or any other means which could at the moment be obtained.

^a When Cray arrived at the front, Jenkins, by order, took him round the trenches, so that when it should become his turn for duty he might know the several works and the points where danger most existed. They had gone into the fifth parallel by the left approach, and were leaving it by the right one, which had a parapet so low it would scarcely cover a crow. "You must look alive here," said Jenkins, "or we shall get a knock." Off Jenkins started, rushing down an enfiladed piece of the trench, and creeping on all-fours where the cover was insufficient. His movements were seen by the Russian riflemen, and a few unavailing shots told of their vigilance. It was now Cray's turn to move, but declining to follow the crafty progress of his experienced cicero, he preferred to make a rush into the completed boyau; but he had scarcely taken a step beyond the parallel, when a tempest of bullets overtook him. With alarming nearness they whistled about his head, and feeling the hot wind of a Minié brushing his nose, as if an iron feather had rasped it, he fancied that that prominent feature of his countenance had been shot off. The delusion was but momentary, for another mishap occurred to drive away the unpleasant sensation which the first had created. As he was bounding into deeper cover his foot tripped and down he fell with a crash, which quite upset the gravity of the guide and the blasters in the parallel.

"I thought you were done for," said Jenkins, as Cray crawled up to him, every muscle of his face in laughing activity.

"Not yet," replied Cray. "It was near enough though to make the escape a miracle." He then added, with a significant smile,—“Some lucky Russian, no doubt, will be decorated with a distinguished service medal for killing me!”

The stricken gabions, turned with their best sides to the front to form the cheeks, were picketed down to insure their steadfastness. Almost all the embrasures in No. 16 battery were mended in this way, and McEachran not to be outdone in the work even gathered some of the broken gabions from the open, and while the fire was warm on the battery built them with much tact and as much exertion into the cheeks. On the right the masked approach to No. 19 battery was thrown down and a ramp rapidly formed for the passage of the guns. As soon as they were hauled through, the gorge was remasked with gabions. One sapper and ten men effected this operation. The succeeding day private Michael McNamara, a firm soldier under fire, was killed by a round-shot while eating his dinner. The ball carried away part of his head.

Immediately after completing No. 15 battery, corporal Hill was directed to oversee by day the miners working in the right demi-parallel of the left attack, which swept in a curve over the edge of the hill, and dropping down its side crossed the Woronzoff road. Under his charge a portion of this trench on the crest of the ravine was converted into No. 17 battery for two guns. As the principal materials for forming it were obtained by quarrying, the construction was difficult and arduous. The revetments were chiefly of stone. Large gabions filled with fragments of rock faced the embrasures, and the soles were bevelled outwards from the necks to admit the guns being sufficiently depressed to fire down the ravine. A magazine for gunpowder and shot was hollowed out of the rock under the parapet, and two traverses were built to protect the gunners from the cross fire of the Malakoff. Constantly were the workmen annoyed by musketry. Shells fell so truly at times that they even burst on the platforms, but the steady miners, habituated to danger, never quitted their labours. Just finished was the work when its overseer, losing the use of his limbs from exertion and exposure, was relieved on the 20th August from the fatigues he had sustained so well during the siege.

On the 21st lance-corporal William Jenkins was slightly wounded in the right knee. Such however was his spirit he

would not leave the front. Exposed to so many hazards in "repairing embrasures and platforms under the most severe fire of the enemy," and present in so many sorties and bombardments it was a wonder he escaped with so insignificant a reminiscence of his exploits. At different times no less than four furious shots have flown through his huge legs without affecting his composure or staying the exertions of his strong arm.⁴ Herculean in stature and strength he was acknowledged by officers and men to be a brave man and competent and quick in every work. Master carpenter of the left attack he was *every day* in the trenches from the 1st of May, and was considered even by his comrades to be one of the most unexceptionable sappers among the rank and file. As a recognition of his useful and gallant exertions he was decorated with a "distinguished service" medal, and granted a gratuity of 5*l*.⁵

By this time the fifth parallel on the right was completed, lying in almost a straight line across the hill from crest to crest, leaving an opening in a fall of the ground near the small quarry next the middle ravine. It was judged best not to touch the hollow as the sacrifice of life in attempting it would then have been enormous. But even this resolve was afterwards given up

⁴ The most remarkable instance perhaps occurred on the 17th October. The second gabion from the neck of the left cheek of an embrasure in No. 2 battery was injured by two shots, and pushed so far from the row as to interfere with the firing. Jenkins tried to remove it, but finding from the strong way in which it had been staked and the earth tamped on it, that more than extra exertion was needed to pull it out, he placed his broad back against the right cheek, and with his leg pressing against the left, hauled with all his might on the gabion. While doing so an 8-inch shot swept through his legs with a velocity so great that the wind of it struck him powerless for a few moments. On went the shot, and smashing one of the wheels of a gun-carriage, threw the gun out of action for the remainder of the day.

⁵ From the second parallel of the left attack ran several boyaux to the third parallel. The angle of the trench where the fourth and fifth zigzags joined, was a very dangerous corner, and many a man in rounding it had been killed or wounded. Early in June when corporal Jenkins was passing with Major Chapman of the 20th regiment, this little "shadow of death," a few rifle bullets whistled so near their ears that their escape was next to extraordinary. Looking up to ascertain the cause of this reception, the Major said, with a good-humoured smile, "I shall not come here again with you, Jenkins, if you wear that swick-band on your cap." The band was a white one.

and the cavity trenched to finish the parallel. In connection with this parallel was an abandoned Russian white rifle pit, which was converted into a commanding post with parapets and banquettes. Smart Minié practice was carried on from that screen by lynx-eyed musketeers, who drew upon themselves showers of grape and canister that considerably damaged the parapets and lessened the number of the marksmen. All repairs however were rapidly executed, which kept the post in constant efficiency.

On the night of the 22nd was commenced a new approach from the fifth parallel on the right attack towards the salient of the Redan. It jutted out from an angle about the centre of the trench. Four or five of the old sappers, indomitable men, with a party of the 1st Royals, worked remarkably well in its execution. Captain Cooke of the engineers had the honour of opening this boyau, and eighty-seven gabions set by flying sap were filled with earth brought from the remote rear in bread-bags. Partial cover was obtained without interruption for fifty-eight yards, during which only one of the working party was wounded.

Next night one hundred men in two reliefs with four sappers under corporal John Ross were pushed into this trench. The corporal marched the working party into the fifth parallel and awaited orders. Captain Wolseley of the 90th regiment, assistant engineer, was on duty in charge of the advance works. From him the corporal received directions to distribute the men to the best advantage. Half the party he detailed to fill bags to be carried by the other half to the sap as required. After these preliminary arrangements he sought the field officer of the trenches and obtained a covering party of twenty men. Eight of the number he kept as sentries in the approach and with the others crept onwards, posting them individually a short distance apart in front of the trace where the sap was to be extended. Having instructed them how to act should the slightest movement of the Russians be heard, and cautioned them, should a light-ball come over, to roll themselves up a short distance from it and lie quiet, he reappeared among his

men. With his four sappers he moved to the vent of the zigzag. Gabions and earth were carried to them by the fifty men. The corporal himself placed the gabions and the sappers emptied the earth into them. Grape and musketry from the Malakoff and the Redan made the task very laborious, for frequently the staked gabions were capsized and had to be renewed. However, they succeeded in placing and filling twenty-five, despite the blazing of light-balls which pitched at times around them and exposed their work. Thus far had the corporal proceeded when he moved the whole party forward, and leading the way with lance-corporal William Baker in opening a trench by the side of the newly-laid gabions, the work had good cover before the morning, and that also which had been executed the night before was strengthened and improved. So interesting and exciting was the work that Captain Wolseley was constant in his visits to the sap and encouraged its progress by his praises. The lance-corporal was wounded a few minutes before the relief arrived. For the "extremely creditable" manner in which corporal Ross performed his duty, he received a present from General Simpson of three sovereigns. This was the second instance of his being rewarded by the commander-in-chief for distinguished services.

Four men of the 77th were wounded and two killed in this zigzag. Two also of the five sappers were wounded, viz., lance-corporal William Baker, seventh company, slightly in the head with stones thrown at him by a round shot, and private James Colquhoun slightly in the right leg. Spare in person like a lean boy, ready apparently to snap at any pressure, Baker stood up in singular contrast to his comrade Jenkins; but few possessed more spirit than Baker; few more of that solid dash indispensable to the stormer. Signalised by his calmness and qualifications in the open embrasures his name was once brought before Lord Raglan, and promotion was given him in appreciation of his soldierly merits.

During the night of the 24th, sergeant Benjamin Castledine was slightly wounded in the head by a rifle ball—the second stroke he had received during the siege. He was giving in-

structions at the time with respect to the revetment of No. 21 battery, situated on the central boyau between the third and fourth parallels of the right attack, and though the wound was such as would have sent most men to the rear, he remained in the trenches after receiving the blow for seven hours visiting his parties.

The new sap on the Redan was the absorbing work on the right attack. Ninety men were told off for it this night; but as the moon had risen, a portion of the men only were permitted to enter the zigzag, who toiled by reliefs an hour at a time. A few experienced sappers acquainted with the incidents and chances of advanced trench duty, pushed spiritedly ahead, and placed eighteen gabions. These were filled in part by the Grenadier Guards, and the former night's work was strengthened by earth thrown over the parapet from sacks passed from hand to hand. The operation was a confined one, for the brightness of the night made it hazardous to send them forward on the reverse of the trench. Sergeant Hale of the Guards kept a small detachment of his regiment so well at work and in such perfect discipline that he was rewarded by General Simpson with a gift of three sovereigns, one of which he retained for himself, generously distributing the remainder among his comrades. Corporal Joseph J. Stanton was in charge of the front saps that night, and amid defections in some of his parties, which it seemed impossible by any amount of example and daring to overcome, the conduct of Hale and his men was so marked that the corporal felt proud to name the sergeant to the engineer officer on duty. Of Stanton, it may be added, that no soldier in the army perhaps, quitted the Crimea with so many decorations. He had medals for the Danube and Crimea with three clasps, a medal for "distinguished service in the field," and the French Legion of Honour. He also became a colour sergeant and was offered a commission, but the war, closing before it could be consummated, the rank was consequently lost.

In the night of the 25th, was begun a prolongation of the fifth parallel on the right, down a small ravine towards a screened wall where the Russians had a picket in ambuscade.

When the moon had gone down, the ground was quickly opened and forty-seven gabions were planted and tolerably filled by five sappers and one hundred men. Three sappers and seventy men were also driving as far as they dare between the small ravine and the white pit connected with the fifth parallel. By these means the entrenched "hollow," commenced with fatal anticipations, was gradually united to the French line of works.

This day lance-corporal William Monds on the right attack was dangerously wounded in the back by a rifle ball, while laying a bridge of planks for the passage of artillery into Nos. 18 and 19 batteries. Strangely enough he was struck a little above the same spot on the 7th June by a sand-bag thrown at him by a shot; and though this injury did not fall into the category of wounds, it caused him much more suffering than the rifle wound which threatened his life.

1855.

26th August—5th September.

SIEGE OF SEBASTOPOL.

State of the works—Russian floating-bridge across the harbour—Gallantry of corporal McMurphy and his sappers—The sailors—Advance from fifth parallel on salient of Redan—And on its extreme left flank—Defection of the workmen in the latter sap and firmness of the two sappers in charge—Valour of sergeant Castledine and private McKellar—Intrepid continuance of the right sap—The double sap, left attack—Fifth parallel of the same attack; corporal Paul its overseer—Experienced hands selected for the front; charge of the non-commissioned officers—Casualties—Fresh details—Trench from fifth parallel to cemetery—Unsuccessful attempt to open a screen in advance of white rifle-pit—Notice of corporal Phillips—A sapper guides his party along the open or part of fifth parallel in preference to taking a longer route though a covered one—Perseverance of sappers in the front saps—Sixth bombardment—The works and repairs proceed steadily—Results of the cannonading—Fatal meeting of friends—Siege career of sergeant Wilson.

ALL the batteries were again fresh and capable, and trunnionless guns and guns with broken muzzles or irreparable vents were in great part replaced by serviceable ordnance. The magazines were firm and full, platforms sufficient and steady, and the traverses stood with scarcely a shot-hole unplugged. On the right the new field structures to rake the Redan and collateral works were in clusters of threes. In front of the famed quarry, and near the fourth parallel, were batteries 16, 17, and 20, facing the salient of the Redan; and 18, 19, and 21, were formed in some trenches in advance of the second parallel, and in rear of the small quarry contiguous to the middle ravine. All the rest of the batteries rose up in natural positions in the parallels and zigzags. Parapets were now formed in both attacks for rockets, which played with brilliant

effect on the Russian works, throwing into flames a building in the Karabelnaia faubourg. A well with a clear spring in the third parallel was protected by a stone wall and ditch, and the parched trenchmen drew in safety from its depths. Bread-bags now almost wholly supplanted the sand-bags. Though ill-adapted for hard service, exigency regarded with favour any device that could be made to do duty in a siege which had more than exhausted the trench materials of our parks and arsenals. To save it from enfilade fire, the left of the fourth parallel of the Chapman attack was altered by cuttings and traverses into the form of a serpentine sap.

With vigour quite as conspicuous, the Russians were toiling. Their immense lines of works, of unequalled strength, were in admirable condition; and rising tier above tier were armed at all points with the heaviest artillery, to bear with harassing results on all our most imposing works and approaches. While fires gleamed from different buildings, and others were breached and broken from base to coping, the enemy, fully alive to the chances of defeat, employed all their disposable tradesmen in constructing a wooden bridge of great length, to span the harbour from Fort Catherine to Fort Nicholas. Signs of activity for this undertaking were first perceived on the 29th July. The wharfs were crowded with stores of all kinds, and many small craft were moored along the quay to assist in the service. As by degrees the vast heaps of timber disappeared, the floating bridge assumed proportions of increasing vastness; and by this time—ponderous, like everything Russian—the causeway was completed for the passage of the troops, when the extremity should arrive to necessitate such an operation.

Extremely brilliant was the night of the 26th; nevertheless, an average quantity of progress was made in the foremost trenches. Grape and shell fell so truly into the saps, that the men were in frequent alarm; and of the 90th regiment alone, 30 men were killed and wounded. Corporal McMurphy was in charge of 130 men of different regiments scattered in the advances. Thirty of the number, allotted to the approach from the fifth parallel to a rifle-pit on the right, were under the foremanship

of privates Moncur and Joseph Fitzgerald. The work was about 200 yards from the proper right of the domineering Malakoff, and the left of the ambitious Redan. From the latter an active fire was opened on the little batch of pioneers, and also from four embrasures on the right flank of the Malakoff. For a time nothing touched them. Shells and grape whizzed over the works, shaking many a nerve and swimming many a head. Few could keep cool in such danger, and picks and shovels were used with timid vigour; but the steadiness of the two overseers was the record of the day. At length the range of the trench was so accurately obtained, that the shells plunged into the very gabions the sappers were filling, and broke them up in the explosions. The wavering of the party was now very apparent, and corporal McMurphy, an old soldier who before had been in a hot siege of thirty days at Natal, exerted himself manfully to keep the men at their tasks. A few tardy efforts was the measure of their reluctant obedience, when one of the party being killed by the corporal's side, the entire detachment ran from the trench, leaving the three sappers ahead bent to their work. McMurphy followed, entreating them, if they intended to abandon their posts, at least to return and carry away the dead body of their comrade. Too craven to perform even this touching duty, the corporal repaired with an undisunayed pace to the sap, and with the assistance of his two intrepid overseers, bore the shattered corpse to the rear amid a tempest of fire, escaping without a stroke. For their gallantry on this occasion the commander-in-chief presented the privates with two sovereigns each and the corporal with three, who, subsequently, was decorated with the French military war medal. Private Moncur also obtained a "distinguished service" medal and a gratuity of 5*l.*, for throughout the siege he proved himself to be a dauntless man under the heaviest fire, and one of the most efficient sappers for conducting difficult work in the advances and in repairing embrasures.

Two days later sergeant Jarvis was again in the trenches of the left attack, having under him 3 sappers and 50 men draining the fourth parallel and making banquettes for riflemen. Sailors

were, for some days, cutting a communication from the first parallel to No. 10 battery in the second parallel, and sometimes, to carry on the approach effectually, they turned miners and blew out patches of rock that impeded them. Nothing was amiss to the men-o'-war's men. In ship, battery, and trench, they were alike English and welcome. Broad-backed, mature, and potent, with beards that fell deep on their breasts, and whiskers that nearly concealed their honest faces, it seemed as if some difficulty would be felt in controlling their energies; but though they defied in their exertions the set rules of procedure, none were more easily led. Working for their own honour they were not jealous of any fame which others might acquire; and knowing nothing of those bickerings and rivallings which in other services often operate mischievously in conducting an enterprise, they laid themselves out cordially to the tasks, and toiled with as much interest and vigour under the engineers and sappers as under their own officers. In ordinary works one sapper was enough for their superintendence, and even when the boring and blasting were in operation the number of overseers among them seldom exceeded two. Indeed they were splendid fellows. Such is the testimony of every sapper who had the pleasure to labour with them.

Going over to the right attack on the night of the 28th, the working parties were seen pushing on in the advanced trenches so sedulously that early developments were promised. Four sappers and forty men were in the boyau stretching towards the Redan. Too light to approach by flying sap, the overseers adopted the method of lodging one gabion and filling it before staking another. In this way the trench was extended twelve gabions. Next night the same number of workmen widened the trench and improved its cover, while eight sappers fixed the gabions and reset those which were occasionally capsized. Every step ahead was treacherous, for the moon was high and clear, and constant vigilance was needed to save the sappers from incautious exposure. To work in day-time in so perilous a spot required bold spirits to make the venture. The engineers would not order the linesmen into it: it was there-

fore left for volunteers to choose the service. Only ten men offered, who at the morning relief moved to the far front, and superintended by a sapper, "worked well and steadily." Passing on to the night of the 30th, eight men of the corps were in the trench continuing it by flying sap. Fifteen gabions were pitched and filled by them. Very hard was the soil: the rock had to be split and rent from the ground for cover, while a heavy fire of shot sometimes made gaps in the new parapet by overturning the gabions. It was a night of toil to these ten sappers, and the result of six hours' patient perseverance only extended the boyau some thirty feet. Eighty linesmen followed deepening and widening the trench. In the night of the 31st eight sappers and ten of the line were again in the Redan advance. So deadly was the approach considered, that the brave men before entering it bade adieu to their comrades. Marvellous indeed it seems that close as it was to the beleaguered defences so few casualties were counted among the working parties. Ten gabions were that night placed and filled by the brigade while the ten linesmen sunk the trench and strengthened the parapet. This was recorded as very excellent progress.

During the same period the new zigzag up the little ravine was steadily advancing on the extreme left flank of the Redan. Major Campbell, assistant engineer, had under his orders on the night of the 28th two sappers and 30 men, who attended so well to their work, that besides improving the trench 30 gabions were planted and made bullet-proof. Fifty more were added the next night by four sappers; and 80 linesmen filled them with stones, bread-bags, and loose earth, persisting in the duty notwithstanding that two of their number were killed and four wounded.

The coolness of different detachments in the foremost trenches was unaccountably dissimilar. Some, though in terrible danger, held by particular enterprises with unrelaxed industry, while others at the moment of alarm took refuge in flight. Many instances of both kinds have been given; here follows another.

In the darkness of the 30th there was a mixed community of

62 linesmen in the approach in charge of two sappers, who, as overseers, moved along the exposed trace and staked nearly 50 gabions. The operation of filling them was about to commence, when some twenty-five Russians, jumping in at the head of the sap with a cheer, so terrified the working party and sentries that they decamped in utter disorder, despite the efforts to rally them of Captain Wolseley, assistant engineer. The trench, now left to itself, was traversed in its whole length by the Russians, who removed the unfilled gabions, threw down much of the finished sap, and retreated, taking with them several muskets which had been left behind by the timid workmen. "Shortly after this, Captain Pechell of the 77th, at the head of a body of his men, rushed up the trench, drove the Russians in from a small rifle-pit, and held it for the night."¹ The artillery fire from the Malakoff, and rattling discharges of musketry from the ravine, occasioned twelve casualties among the workmen and wounded Captain Wolseley severely in the face and leg. The two sappers—privates B. Murray and Patrick Nelles—it is noted stood by their captain to the last; but their steadiness behind the imperfect cover of some overturned gabions—the one firing, the other working—had not the effect of provoking the recreants to re-enter the trench.

It was an adventurous sap this, menaced at every point of its progress by shells and Miniés, and checked by reiterated attacks of Russian detachments, who, surging over the parapet, burst in the trench itself. In the night of the 31st it was again assailed. Eight sappers and 50 men of the line were allotted to extend the approach, with corporal Taylor in charge. Sergeant Castledine was directed to superintend both advances, but from necessity his exertions were chiefly confined to the sap in question. He had been in this boyau before and knew its danger, for he had seen as many as five shells blazing in it at one time. Private John Bramley being the oldest sapper took the lead. He had to place two gabions, and after filling them fall to the rear. Before, however, completing his task, which was about half an hour after the workmen had been distributed,

¹ 'Nav. and Mil. Gaz.,' September 15, 1855.

the enemy—more than a company strong—appeared on the high ground near some rifle-pits, and firing on our sentries the latter hastily retired. As soon as they were calmed, sergeant Castledine, by order of Captain Fraser of the 95th regiment, who commanded in the sap, reposted them in the most desirable positions. A desultory firing was kept up for a while without again alarming the sentries or disturbing the labours of the trench; but when another half-hour had elapsed the enemy suddenly pushed up the slope, attacked the sentries, and driving them into the trench, the workmen and covering party took fright and retreated in confusion. Castledine and private McKellar of the ninth company, who were at the head of the sap, alone stood firm; and before the enemy had approached too far, the sergeant sent his steady assistant to recall the sappers from the fifth parallel, into which they had hastened to recover their arms. At this moment the sergeant of the 3rd Buffs, who had heard the firing, ran across the open and voluntarily joined Castledine. In a few seconds the sapper brigade, with that manly fellow McKellar in front, flew into the work, and with this small force the sergeant bounded over the parapet, poured a volley into the hesitating Russians, and then for two or three minutes, while retiring to the sap, continued an independent discharge, which kept the enemy at bay till the covering party, rallied by Captain Fraser, returned and increased by its fire the efficiency of the defence. In the struggle Captain Fraser, who had publicly acknowledged the valour of sergeant Castledine, fell deeply wounded; the other officers were also struck down, and the command of the parties now devolved on Castledine. His force of character gained the noblest support from his brigade as well as from the sergeant of the 3rd Buffs, and even held together the young men who for the first time were entrusted with duty in so perilous a sap. Though the fire of artillery and musketry was sharp enough to make the stoutest hearts quiver, Castledine retained the trench and resumed the work; but, as every missile that entered the sap drove the workmen to their arms, very little resulted from energies so harassed and so capriciously employed. Still, such was his

high respect for authority, the sergeant would not take on himself the responsibility of ordering the workmen to retire, and so sending corporal Taylor to the engineer officer—who was directing the progress of other works—he requested permission to remove them. This was acceded to soon after midnight, the party taking with them eleven of their comrades and three of the four officers wounded. The sappers now had the run of the deadly trench, and, undisturbed by the fears and clamours of timid men, laboured with so much dexterity, that, by the hour of relief—two in the morning—they had succeeded to admiration not only in strengthening a portion of the old trench, but in resetting and filling sixteen of the gabions capsized by the Russians the previous night.

Equally dangerous was the double sap forming the central communication between the two foremost parallels on the left attack. Not without great toil and watching was it completed. In aspect it bore a wild crenated outline, as if the miners, in struggling to make a direct approach, were so oppressed with difficulties that, defying the energy and capacity of art, they were forced to make progress by running into sidings and notches. The last gabion to connect the sap with the parallel was fixed by corporal Lendrim. The whole way was broken up by mining, and the planting of every gabion was attended with imminent risk. Stones blown from the rock were built into the parapets and compacted with earth and clay thrown among the blocks from sacks and bread-bags. So fierce at times was the firing and so clear the moon, that the extension of the trench throughout an anxious night was confined to the placement of only four gabions. Some nights the sap was pushed ahead as much as ten yards, which was regarded as an exemplary effort. “For every three gabions fixed during the night two were knocked down at daylight by round shot;” and not unfrequently one has been struck from the hands of the sapper essaying to stake it. Such gaps and such violence sufficiently mark the trials of the undertaking and account for its slow and wearying progress. Up to the close of the siege the sap demanded the labour and vigilance of small parties to patch up the broken

revetments and replace the shivered gabions. Never were there less than two sappers in this zigzag; seldom fewer than 20 of the line.

Perhaps one of the hardest services during the whole operation was the working of the fifth parallel on the left attack. Sweeping round the brow of the hill, it dropped down the cliff towards the *chevaux-de-frise*, and ended at a cave which served as a place of arms. To the left it extended, with diminished cover, towards the direct double sap. The boyau communicating with the right of the parallel was a trench about forty yards long, and from the parallel itself issued several small covered ways in advance, with pits at the extremities for riflemen. No trace was followed in the execution of these lines; no breadth, no width uniformly adhered to. All depended on the nature of the obstacles encountered and the stern intricacies of the work, which, giving rise to many deflexions to meet the broken contour of the ground, resulted in a line of sap so irregular in form, as to require many stout traverses and auxiliary cuttings and parapets to prevent certain parts being raked and exposed to cross fires. The labour in executing it was immense, for every inch of the way was driven through rock by the irksome processes of boring and blasting. The hazards were unmitigated; the firing at times terrific; but guided and managed by the experience and judgment of corporal Paul—to whom was entrusted the superintendence of the parallel and its branches—the casualties were so few as to excite surprise. Only one man of the blasting party was killed in the parallel. He was a brave and pushing miner of the 20th regiment. Seldom were less than twenty mines fired in a day, frequently as many as forty. The stones thus broken up were mostly worked into the parapets during the night, but the facing of the work and the formation of the banquettes were left for the miners to attend to in day-time. All the large stones were employed for these purposes; and on one occasion, when building the revetment in the portion of the parallel which descended the hill, one huge block required the united strength of the overseer and the 20th man to fix it firmly. It was a stubborn task,

executed only by risking danger; and at frequent intervals for nearly a quarter of an hour they were exposed from the waist upwards in doing it. Immovably calm, always fresh in vigour though constantly at work, a better overseer than Paul could scarcely have been provided for difficult employment, and as a consequence, his example—of zeal, perseverance, and coolness, approaching even to placidity—had the best effect on his parties. So wrapt up was he in the progress of the trench—indeed it was said he was never happy out of it—that his comrades termed the work “Paul’s parallel!” Let not this be an aggravation of the charge preferred in jealousy and ill-feeling against the engineers, because certain works, by common consent, were called after the names of engineer officers—now memorable in history. In this case the application of the designation was simply a sapper one; and if among his comrades who knew of his soldierly qualities and exertions in that trench, which but for his care would perhaps have become a human shambles, he was considered entitled to this very natural honour, who will write an angry pamphlet and say the distinction is unbecoming and should be borne by some one of another corps? From the beginning of the siege he performed severe duties in the front. Before his worth as a sterling sapper was known he was commonly four or five nights in the trenches out of six, and was one of the surest guides to the works when the positions and the roads to them were as yet ill understood by the troops. Selected by Major Bent to be one of his foremen of miners, he was daily in the saps from the middle of May. His permanent duty commenced with the boyaux between the second and third parallels and only terminated a day or two before the fall of Sebastopol. So much for the bravery and spirit of a non-commissioned officer, who, deserving great rewards, became a sergeant, received a gratuity of 10*l.*, a silver medal for “distinguished service in the field,” and the proud decoration of the Legion of Honour.

Here it may be remarked that for all the foremost works only experienced hands, upon whom reliance could be placed for qualification and constancy, were selected to lead the work-

men. Young soldiers lacking strength and patience in toil and danger were unfitted for the hardships and vicissitudes of the front. So scattered at times were the working parties over the embarrassing meshes of trenches that a private of the corps at different points of the works has been nominated to oversee two small detachments of the line. Wanting rank as non-commissioned officers, they were often resisted, and as supineness in the pioneers sometimes followed, the service naturally suffered. In most cases, however, the sapper privates gained the compliance of their men more by their own earnest example and exertions than by any exercise of authority. Corporals and sergeants frequently controlled the energies of very heavy parties, but when they had any trying or dangerous works to execute entailing the necessity of close observation and personal toil, the workmen under them were usually limited in number. In the latest weeks of the siege, sergeant Jarvis, who was almost daily in the trenches, had with him a force of between forty and fifty men and three or four sappers. His duties were then mostly confined to the fourth parallel on the left, and included the drainage and repairs to banquettes, traverses, and parapets. A firm soldierlike man, with strong physical powers, his conduct throughout the siege in the execution of hard and critical services attracted the notice of his officers, and his bustling activity and usefulness, coupled with his bravery, gained him the decoration of the Legion of Honour. Corporal Cray shared largely in the concluding operations in mending and re-forming embrasures and batteries, assisted sometimes by as many as eight sappers and fifty workmen. His chief work in the trenches was overseeing the rebuilding of No. 8 battery, left attack, so as to alter its line of fire; and the creditable manner in which it was executed was recorded by Major Chapman as one of the incidents of his brave and useful services in Bulgaria and the Crimea. Corporal Hanson is also named in connection with services discharged in 19 battery of the Chapman attack, in which, aided by two sappers and fifty men, he mined the rock and thickened the parapet with the stones thrown up in the blasts. These instances, officially

recorded, and, hence, here preserved, may be taken as the average measure of command meted to non-commissioned officers of sappers in the closing throes of this great struggle.

Between the 30th August and 2nd September the following casualties occurred :—

Left attack.—30th. Private Thomas A. Eccles—wounded severely in the head.

31st. Private William Thompson—wounded slightly in right shoulder.

Right attack.—2nd Sept. Lance-corporal Charles Bell } killed, while fixing
2nd „ Private John Morrison } the last splinter proof
timber to the magazine of No. 21 battery, by a shell—
the first that dropped there from the Malakoff. The
former was struck in the side; the latter in the head,
besides which a fragment shattered one of his arms, and
another exposed his bowels.

2nd „ Private Joseph Fitzgerald—wounded dangerously; his
head was fractured by the blow of a stone, which drove
a portion of the peak of his cap into his skull. Perse-
vering and cool, he was a man in whom dependence
could be placed for progress under difficulties; and for
his valiant conduct on the 26th August was noticed
in the orders of General Jones, and rewarded by the
Commander-in-Chief.

Early in September a small batch of sappers and linesmen fixed six lengths of chevaux-de-frise in extension of the barricade across the Woronzoff valley, and threw up a circular breastwork, issuing from the trench on the right of No. 17 battery of the left attack to flank the main road. An attempt was also spiritedly made to connect the two attacks by running an arm across the ravine and up the hill from the second parallel of the left attack to the right of the third. The gabions laid for the purpose by the sappers were rapidly filled by the line, and a few nights more would have witnessed the completion of the communication, but ulterior events rendered further labour in that trench unnecessary. In the fifth parallel, facing the Redan, two sappers formed loop-holes, chiefly of bread-bags, at intervals along the entire trench for light troops.

In the cemetery the gabionade being much shattered was quickly repaired. A trench too was run out from that gloomy

area, crested by a parapet made up of the usual expedients; and the rude slabs and blocks which, struck down and broken by shot and shell, lay confusedly over the ground. Another was cleverly cut from the point where the double sap joined the centre of the fifth parallel, and, descending the hill in a backward sweep, connected with the approach from the cemetery. Two or three brigades of sappers, working simultaneously at different parts of the trench, fixed the gabions sometimes by the flying method, and at others, when the firing was heavy, by the surer plan of completing the cover before moving an inch in advance. One night at this sap corporal Henry T. Stredwick had with him a half brigade of sappers who were tasked to lodge and fill eighteen gabions, but the moment they began to work a galling array of heavy projectiles opposed every foot of progress. Repeatedly the gabions were capsized; full ones on two or three occasions were blown from the trace, and the sappers knocked over and buried under them. Even resolute men would have had ample excuse for abandoning so murderous a spot; but regarding nothing as insuperable or too hot, the sappers held obstinately to the work, and succeeded in lengthening the trench by twelve gabions. A rifle-screen was partly formed half way between the cemetery and the central communication to the fifth parallel, and two old Russian pits, by a slight deviation, were embodied in the sap. A gentle ridge being on the line of trace, the sappers, too quick to calculate the inconvenience of their go-ahead zeal, planted the gabions for the revetment nearly on its edge. Once filled, the earth thrown up for the parapet fell down the slope, and no end of bread-bags were emptied to gain cover. There was no remedy for the defect but perseverance; and this being cheerfully yielded, a tolerable mound in time had risen, which outvied in strength with the contiguous parapets. The work was chiefly done at night; the darkness was great, the firing incessant. Varied was the progress; sometimes as few as nine or ten gabions were fixed, at others as many as twenty-four. This was looked upon as excellent work, and St. Jacques of Monzon himself might

have been proud to share in such success. Steadily was the trench pushed on, and in a few days it was numbered among the finished formations.

In the night of the 2nd it was intended to open a screen in advance of the white rifle-pit on the right attack. Two officers of engineers reconnoitred the ground, attended by a volunteer party carrying tools and gabions. Being perceived, the enemy's pickets plied them with so hot a fire they were compelled to make a hurried retreat, while the men who were struck bore on as best they could with gashing wounds; but one poor fellow, more deeply injured than the rest, was left on the field. Indisposed to yield their comrade, sergeant Newman of the 62nd led back six men, one of whom was private McNamara of the sappers, to search for the missing man and recover the abandoned tools; but another volley of hissing bullets drove them in haste to the sap. Yet again did these men offer their services to renew the search; but as the moon had newly risen, rendering distant objects visible, the engineers wisely declined to permit an exploit which in all probability would have sacrificed the entire party. For his spirited conduct the sergeant received a present of three sovereigns from General Simpson.

Passing on to the night of the 4th, there were 17 sappers in the trenches on the left, and 32 on the right. Those on the left were distributed in 17 and 19 batteries, and the circular breast-work, flanking the Woronzoff ravine; a few also were in the cemetery, and others in the excavation leading down the hill to it. Of this small party two were wounded: private John Boyce severely in the eye, and second-corporal Charles Phillips, "a most zealous and active non-commissioned officer," in both arms. The left was broken above the elbow by a grape-shot, and though subsequently cured without amputation, a frightful limb was left, withered, rigid, and useless. He had been working during the early night in the double sap with Mooney and Lancaster, two first-class sappers, from which he was removed by Lieutenant Neville to complete the screen spotted half-way between the cemetery and the sap to the fifth parallel. He

had with him four men of the 57th regiment. As the screen was small, and barely permitted the little batch to move in it, the corporal jumped from the hole, and directed their exertions on the open slope. He also withdrew one of the privates, and soon after on came the grape, inflicting the injuries described and striking the hilt from the bayonet of his comrade.

Boyce had missed his way and wandered with his men into the double sap. Corporal Phillips happening to be there at the time, instructed him how to rectify his course. The route was one of risk, for the trench down the hill had only been cut in parts. Sooner than retrace his steps, and thus obtain the cover necessary to protect him, he shot across the open at the head of his men, and luckily reached the spot to which he had been appointed without casualty. The injury to his eye occurred soon after.

The sappers on the right were chiefly in the advance works, extending the trenches by flying saps. That on the Redan was prolonged 31 gabions, which were all loaded with earth and stones; and the other up the little ravine had 36 gabions staked, but only 16 filled. The moon now appearing put an end to the onward flight of the sappers, who when withdrawn into safer cover brought with them the body of Captain Anderson of the 31st regiment, assistant engineer, who was killed while directing the approach to the Redan. Few, indeed, left those perillous saps without a scar, or a shot-hole in their garments. "From the heavy fire maintained on the head of our sap," wrote General Simpson, under this date, "the progress made has been slow, and accompanied, as must be expected, by several casualties among the sappers and working parties."

At the morning relief of the 5th there were 53 sappers and 41 line miners in the left trenches from five to nine o'clock, and 17 from three to seven in the evening, who placed the batteries in substantial order for the intended cannonade, and completed the splinter-proof hut for the surgeons in the first parallel. To-day commenced the sixth bombardment, very warmly by the French, less so by the English, who only discharged periodical

shells at the Redan and Garden batteries. *Brisk as was the fire from the Russians, only one man of the working party, out of about three hundred men, was killed on the left, viz., lance-corporal Richard Pinch—a very useful sapper, who had been wounded on the 26th July.*

On the right there were 16 sappers employed all day in superintendence, chiefly in the deadly saps. A few were also scattered singly to No 18 and the batteries in the first and second parallels, restoring embrasures and revetments. Two or three were finishing the doctors' hut in the quarries, a like number plugged up shot-holes in the parapets, and three others were founding a new battery—No. 22, near Egerton's pit—to open on the left flank of the Redan. With singular good fortune, only one casualty occurred among the workmen in the right attack, although a fire of average steadiness dismounted a gun in No. 17; knocked down the embrasures of No. 14, and *damaged two or three magazines.*

Night came on, and 32 sappers with 400 linesmen poured into the Gordon trenches, and half the number were detailed for the Chapman lines. Both parties were on duty for six hours, confining their exertions, in great part, to the renovation of the embrasures, merlons, and magazines. The front saps were still perseveringly advanced. Sixteen gabions were added to that advancing towards the Redan; and the unfilled ones, lodged the previous night near the little ravine, were crammed with earth in sand-bags brought from the rear. What was most unusual, not a shot or shell entered the saps during the darkness, and freed from this annoyance the workmen added much to the solidity of the trench. No. 22 was rapidly rising amid the general restorations, and while the chasms produced by driving shot and bursting shells were being filled up with the readiest contrivances, the battered magazines stood up with stronger roofs and stouter stanchions.

The effect of our fire was visible in the burning of a line-of-battle ship in the harbour, which threw out sheets of flame of such breadth and intensity, that the Russian works were wholly illuminated. Its magazines blew up, one after another, its

shot guns exploded, and in time the huge timbers which formed its ribs and walls were burnt to the water's edge. Some storehouses on the west side of the dockyard creek also took fire, and blazed away till they had collapsed into ruins. These calamities did not in the least check the vigour of the besieged ; the usual firing was kept up but with insignificant results. Not a man on the left was injured ; and this shows what an outlay of treasure, endurance, and courage it costs to take at long ranges a single life. Private James Chesterman, on the right attack, was wounded slightly.

Two old acquaintances who had not met for years chanced in the early night, as the darkness was falling, to recognize each other in the quarries. Each grasped the other's hand, and while engaged in an animated greeting, with the warm smile of welcome on their lips, a round-shot struck off both their heads ! The friends were sergeants William Wilson of the corps and Morrison of the royal artillery. A genuine Scotchman was Wilson, with an accent as provincial as a Highlander. Thick-set, well knit, and athletic, he was formed for the hardships of labour. His composure under fire was remarkable ; of danger he knew nothing. Among detachments of the corps he was the spirit of the trench, and moved about the lines and batteries with the same air of tranquillity as in a workshop. As a sapper few were more excellent, few more apt and bold in situations of difficulty, peril, and surprise than he. Throughout the siege he scarcely ever missed his turn in the front. If counted up, it would be found there were not many in the corps who had passed as many *months* in the trenches as Wilson. Safe and reliable, he was greatly in requisition by his officers. When new approaches were to be opened or new batteries constructed, Wilson, if not more importantly employed, was mostly deputed to start them. Indeed, of the execution of many he had the charge, and the tact he exercised in the arrangement of his working parties was something extraordinary. For many weeks of the concluding operations he was rarely away from the trenches, and had he lived, his brilliant services would have put him in the possession of the highest honours it

belonged to his class to wear. That non-commissioned officer must have been a valuable public servant, when testimonies like the following—written under feelings of sorrow and sadness for his loss—became records of his merits :—

“ I regret much,” wrote Lieut.-Colonel Chapman to Sir Harry Jones, on the 6th, “ to have to report that sergeant Wilson of the first company royal sappers and miners was killed in the quarries by a round-shot yesterday evening.

“ Frequently commended, and not long ago promoted for his distinguished conduct during the progress of the siege, this excellent sergeant of sappers has earned the esteem not only of three successive directors of the right attack, but also of every officer under whom he has done duty.

“ Always ready for whatever he might be called upon in the severe weather of last winter; ever foremost at the point of danger, he has left to the young soldiers of the corps an example of devotion to the service which they may do well to emulate.”

This was the opinion of an officer who had a thousand opportunities, in the different phases of the siege, of taking the measure of this exemplary non-commissioned officer. A reflex of this commendation found its place in the brigade-orders of the 6th September in these words :—

“ The corps of royal sappers and miners has lost in the late sergeant Wilson a non-commissioned officer distinguished for his conduct throughout the siege; ever foremost in danger and respected by the various officers of royal engineers under whom he served in the campaign.

“ Such an example is worthy of imitation by the young soldiers of the corps, whose reputation must always be increased while numbering among its members individuals like the late sergeant Wilson.

“ By order,
(Signed) “ E. F. BOURCHIER.”

Such was Wilson.

1855.

6th September—9th September.

SIEGE OF SEBASTOPOL.

State of the batteries—The foremost saps—Repairs to embrasures while opposed by blinding dust driven through the trenches by a fierce wind—Distribution in the trenches—No. 22 battery—Final attack of the Redan and the Malakoff—Names of the sapper storming party—Their brave and steady demeanour and exertions—Escapes of corporal Baker—Valour of private Bowman—Casualties—Continuation of the foremost saps—Daring adventure of corporal Ross—His report leads to the bloodless occupation of the Redan—Conduct of the corps in the siege—Captain Ewart—Reflections.

WITH no abatement of activity the works progressed on the 6th. The sap on the Redan had 60 men working in it, and extra efforts were given to build No. 22 battery on the right. In both attacks there were 58 sappers, 32 of whom were carpenters. The embrasures were put in as fresh a state as possible; the platforms were in good condition; the magazines and traverses tolerably sound, and even the early batteries, whose age and decrepitude gave reason to expect their fall, looked up with more firmness than was warranted by their scared complexion and feebleness. Broken and hollowed, as if water-courses had worn their faces, the best that could be done was to bolster them up to stand a share of the fire from day to day. Sand-bags were filled in great numbers during the night, and eight sappers cut new embrasures in No. 13 battery, and patched up its shivered parapets and merlons. Forty men of the 14th regiment passed the materials to the sappers, and

exerted themselves with so much spirit that the work was nearly finished. "Great credit," says Captain Nicholson of the engineers, "is due to them and also to the sappers who directed them."

At eight in the evening 34 sappers were pushed into the right lines, and 16 into those of the left, who were generally employed in restoring the bombarding batteries, several of which had been greatly injured during the day; some of the merlons were also damaged, and there were gaps in different parts of the revetments. Nearly all the repairs and reforms had been executed before the parties quitted at two in the morning. The few embrasures which could not be completed were masked, to protect the sappers who might be allotted to the work next day.

In the fiery sap on the Redan there were 2 sappers and 40 of the 90th regiment, by whose exertions twenty-five gabions were added to the trench, which was, moreover, strengthened where necessary, and backed up with earth. The approach now began to curve to the left, and thus to form the starting-point of the sixth parallel. The head of the sap turned into an indurated vein, which, from the difficulty of moving it, augmented the fatigues of the men. Crowbars and picks driven into chinks partially loosened the rock, which, broken up into fragments, was piled into the parapet. All worked with so much zeal that notice was taken of their services, and corporal John Wright and private Bernard Murray were named to General Simpson for their personal labours and effective superintendence. During its progress a light-ball fell very near the sap, which exhibited its whole outline. Every head was sunk below the revetment in an instant, and as the flaming compound was speedily extinguished by earth thrown on it from the parapet, not a man was touched.

In the right approach near the little ravine there were two sappers and about 50 men. Its prolongation was by flying sap, but its progress was exceedingly tedious. Eleven gabions were staked, but nine only filled. So true was the work in range, that the party shelled out had to take refuge in securer trenches,

bringing with it four men wounded. Not only had the workmen to bear a direct fire, and to be disturbed and interrupted by light-balls, but to suffer from accidents arising from shot and shell rebounding from the hill-side, and rolling in all their fury into the sap beneath.

Six sappers in the 21-gun battery repaired each an embrasure, all of which were in a very shattered state. Fierce and gusty was the wind at midnight, collecting the dust and light sand in its vortex, and blowing it in the faces of the workmen. The trenches were swept as if a hurricane were passing. Difficult to hold up against an annoyance of this kind, the progress made in every direction was, nevertheless, satisfactory. "I may," writes Lieutenant Rauken, who was the engineer on duty for the right attack, "take this opportunity of reporting very favourably of the manner in which the sappers and men employed in repairing the embrasures of the batteries performed their work, in spite of a high wind and blinding dust;" and Sir Harry Jones, in seconding the commendation, thus wrote to the Commander-in-chief, "I should recommend that notice be taken in general orders of the conduct of the sappers and 90th regiment."

On the 7th, 55 sappers remained a long day of fourteen hours under fire. On the right the linesmen were relieved four times; on the left twice in the day. The carpenters, 16 in number, were chosen men under sergeant Leitch, the master-carpenter of the right attack, who had been daily in the trenches from the end of June. With energy never before surpassed they laid four gun platforms in No. 22 battery and built there a magazine, as well as one in the quarries for small-arm ammunition. In the following night there was a similar force of sappers at work, who, having had an ample supply of sand-bags and gabions, made good all the breaches in the embrasures and parallels. Accustomed to encounter danger, they worked steadily and manfully, as if the point of hazard and duty were the place of safety. The distribution of the workmen on the right attack was as follows:—

	Sappers.	Line.
No. 22 battery	4	60
Magazine in quarries . .	1	10
Fifth parallel	6	160
Repairing embrasures . .	14	70
Sap on Redan	4	80
Total	29	380

The working party and sappers on the left, were confined in great part to the bombarding batteries.

No. 22 battery was completed during the night, its embrasures opened, ramps cut and guns brought into it; but this formation, pushed on with so much zeal, was never armed. Near Egerton's pit it stood, the creation of many hours' strenuous toil, as impotent as a ruin.

The sap leading to the Redan was improved in cover by heaping sand-bags on the gabions. It had been run out about 600 feet, and stopped 197 yards from the salient. As far as it went it was complete, and banquettes were built along its length as also in the fifth parallel for sharpshooters. A hundred men of the Highland brigade built the steps, of old casks, broken gabions, and fascines, under private George Harvey, whose spirit and steadiness never relaxed for the eighteen hours he was on trench duty. Nothing was left undone to be ready for an attack, which it was arranged should take place the following morning.

Next day—8th September—17 sappers and 50 men of the infantry were in the left works, mending the breaches as they occurred in battery and trench; and one man of the corps was wounded. No working party was given for the night attack, as the assault on the Redan by the English, and the Malakoff by the French, was ordered to take place at midday. A number of scaling ladders had been carried to the sap approaching the salient during the preceding night, and all the engineering details for the storming were fully prepared by daybreak.

For the assault a column from the second and light division was formed as under:—

	Men.	
Covering party . . .	200—to	keep down the fire from the enemy's embrasures.
Armed party . . .	320—to	carry and place ladders, with 21 sappers under Lieut. Ranken, R.E.
Main body of assault . .	1000	
Armed working party . .	200—with	entrenching tools under Captain Sedley, R.E., to follow when a lodgment had been effected.
Supports	1500	
Gunners	20—	under an officer with spikes to spike guns, or turn them if necessary.
Additional supports . .	3000 —	drawn up in 3rd parallel, in communication with the French right attack, and in the middle ravine.

The whole were under the command of Lieutenant-General Sir William Codrington and Major-General Markham, but the storming party was directed by Brigadier-General Windham. Sir Harry Jones, the chief engineer, though suffering from an attack of sciatica, and barely recovered from his wound, was borne to the sap on a litter to witness the assault.

Three days' incessant firing had considerably injured the enemy's works, and loosened the whole fabric of the lines; but the guns of the Redan and various batteries, peeping from beneath strong rope mantlets, triply plied and tarred, were still serviceable. The apertures through which the missiles were disgorged—small as possible for the purpose—were further blinded by a tarred rope disc matted round the muzzle of the gun just in front of the trunnions, which interposed between the sight of the English riflemen in the trenches and the unseen gunners in the Redan. Ragged and deformed as were the batteries, they, nevertheless, bore up with veteran fronts, and as but few of the Russian artillery were silent, it was expected that the resistance would be obstinate.

At twelve o'clock the French, emerging from their saps—which were about 20 yards from the edge of the Malakoff ditch—bounded into the tower and the little Redan. With a display of heroism which befitted their ancient prestige they captured the Malakoff; but though the little Redan was penetrated by a portion of the column, it was met by a solid mass

of the enemy, which sprang on the allies with a fierceness so irresistible it was in vain they contended; and a few minutes more saw them hastily retreating to their lines. Meanwhile the attack on the tower proceeded with desperate violence. Few struggles for triumph were more determined and terrific. At last the Malakoff was won; but the achievement cost a shuddering sacrifice of the best troops of the Emperor.

Now came the signal for the English to advance. When the column knew that the French had conquered, excitement was at its highest, and eager to show how the Redan could be captured, the skirmishers vaulted unexpectedly over the parapet from the advance saps before the party with the ladders had time to debouch from the head of the trench. This was an anxious moment for Lieutenant Ranken. Equal, however, to the difficulty, he run out the sappers, carrying crowbars, axes, and a few intrenching tools, with all speed to the front, and flew on with the foremost ladders under a close fire of musketry and grape. The distance between the gorge of the sap and the ditch at the salient was 197 yards, and in striding on with the ladders across the open slope many a brave man fell. Nevertheless there was no halting, for the stormers were selected for the duty on account of their approved courage; and the column pressed on to the abbatris, which was instantly trodden down or pulled aside by the foremost men with as much ease as if the boughs had been faggots of sticks. Through the gaps the assailants pushed, followed unswervingly by the leading ladders, each 24 feet long, which were quickly planted against the counterscarp of the ditch, the height of which was barely 15 feet. The first one was planted by sergeant Leitch and private Harris, and the latter was the first man to descend by it into the ditch. Scrambling down, many tumbling headlong from the surge behind and many more in the heat of desire jumping into the moat, the stormers quickly tossed the ladders across to the escarp, up which ascended a stream of daring fellows into the body of the work. So skilfully were the ladders placed around the salient, that the troops in sinking into the ditch or climbing into the Redan were but little exposed to the flanking

fire of its faces. The first portions of the column moved on steadily to the attack, but succeeding parties running to the head of the sap were so blown, they waited for a few minutes to recover breath. This done, they started in fitful batches, assailed by a withering *mitraille*. No longer in the orderly formations which characterize the battle-field, the troops in independent groups or sections reached the ditch, where, swelling around the salient, they dived into the fossé, and ascended or descended the ladders, as the events in the Redan fed their courage or starved their ardour. General Windham, whose valour and marvellous escapes on that day have astonished Europe, made his way into the place with some 80 or 100 men, but such was the virulence of the fire, such the carnage, a few only of the bold men who had had the temerity to mount the parapet could be induced, though the General himself walked amid the deadly storm, to rush from the traverse behind which they had shielded themselves.

Meanwhile the sappers, one of whom was appointed to every two ladders, after assisting to rear them in the most secure and advantageous situations, were collected by Lieutenant Ranken and set to work to form a practicable entrance into the Redan by means of a ramp. Wherever else their discipline failed, here it was perfect; and not a pulse of fear seemingly beat in any breast. Earth for the ascent was tumbled from the parapet above by a few of the party. Harris was the foremost sapper. Under a horrible fire he bravely tried to dig himself down behind the escarp revetment in order to push the gabions into the ditch, but the soil had been so strongly tamped, and was otherwise so solid with shot and shell which had poured into it from the breaching batteries that he gave up the attempt, and employed himself in efforts which, though they promised less, were in the end more certain of success. At this time there was only one shovel with the party; the few intended to come up with it had failed through casualties and accident. The bulk of the tools were with the lodgment party still in rear. Much depended on the use of this one shovel, but it was soon shattered to atoms in the hands of the workman, private Oldham.

The earth was now literally pushed from the parapet, and a rough incline in a few minutes was executed. So easy indeed was the ascent by this simple means, that the stormers rushed up the slope, steep and yielding as it was, in preference to climbing the ladders. As the workmen, waiting for the signal to advance had not yet come up, Lieutenant Ranken now appointed his sappers, aided by a few men of the assaulting column, to throw up a breastwork to the left of the salient across the ditch, to counteract the raking fire of the enemy. Well was it that the moat was only eight feet broad. Had it been a yard or two more the service might have been attended with a sacrifice of life appalling to contemplate. Gabions and fascines and boughs of trees and small rough timbers which had been used as binders by the Russians, were torn by some strong and impetuous sappers from the face and crest of the counterscarp to form the caponnière. Earth too was thrown on the rising mound from the parapets above, and the gabions, by extraordinary zeal, were loaded with sand and stones dislodged from the revetment and grubbed up from the bed of the ditch. In this way partial cover was obtained, but it was yet too shallow to protect the troops from the sharp peals of musketry which poured up the fossé. For about twenty minutes the work was persevered in when the impossibility of proceeding, temporarily suspended its progress.

By this time a working party of fifty men of the 77th regiment arrived. No signal for advancing had been given to them, for the almost hopeless state of affairs in the Redan did not warrant the step; but corporal Baker, a trustworthy sapper of known intrepidity and judgment, properly anticipating there would be occasion for the services of a working party, led the detachment to the salient, and driving into the ditch was soon engrossed in the construction of a caponnière across its bottom, a little on the right of the salient. While these engineering details were being stubbornly executed, the troops in the Redan, vainly waiting for two hours to seize an opportunity to dash into the town, many falling in the stand they had made around the traverse, commenced the retreat. With it retired the working party, the ladder-men and sappers; and in passing

the open—till the gorge of the foremost sap was reached—so hot was the fire upon the repulsed stormers, that the ground was covered with slaughtered hundreds.

The names of the storming party of sappers were—

	Company.
Sergeant Peter Leitch . . .	2nd—wounded severely in the head.
Corporal James Curgenven . .	10th
2nd corporal David S. Osment	1st
Lance-corporal William Baker	7th
Private John Stephens . . .	1st
" David Boyd . . .	1st
" William Bennett . .	1st
" Peter Delany . . .	1st
" Thomas Whyte . . .	1st
" David Carswell . . .	1st—wounded dangerously in the head, died 18th September, 1855.
" John T. Harris . . .	2nd
" Samuel Hammett. . .	2nd—wounded by grape-shot in left leg, and while hobbling back to the 21-gun battery, was killed in the trenches by a round-shot, which carried away his head.
" James Broad . . .	7th
" James Aitchison . . .	7th—wounded slightly in the right arm.
" Christopher Digweed	9th
" John Whitford . . .	9th
" William Clark . . .	9th
" John Oldham. . .	9th
" John Wotherspoon . .	10th
" Peter Ruthven . . .	10th
" Robert Garrett . . .	10th

"The sappers," writes Lieutenant Ranken, "all behaved well and exerted themselves in carrying out my orders to the best of their power." He then proceeds, "I beg especially to call your attention to the conduct of sergeant Leitch who was wounded, and corporal Curgenven who, with privates Harris and Wotherspoon were up with the leading ladders and who worked hard in pulling down gabions and placing and filling them according to my instructions, and of lance-corporal Baker who came up subsequently with the working party of the 77th, and who showed coolness, zeal, and activity in executing my orders."

Singular were the escapes of corporal Baker. A musket-ball passed through his cap carrying it a few yards in his rear,

and another bullet knocking both heads out of his water-bottle struck him in the hip as if a stone had been thrown at him. Had it not been that his canteen was full of water, the ball in all probability would have inflicted a dangerous wound.

It is not often that men who have but little hope of distinction before them, voluntarily undertake a supererogatory service, in venturing which is likely to subject them to the penalties of martial law. Such however was the case with private John Bowman of the first company who was of great height and strength, intrepid and useful. He had been sentry over the tools in the quarries; but when the signal for the advance was given he quitted his post without orders. In passing to the front he saw Captain Sedley of the engineers in the fifth parallel severely wounded. Tendering his assistance he placed his strong arm round the body of the captain and holding him up by the waist-belt supported him to the rear, where he left him in care of a few men who bore him to the camp. Impatient to share in the assault, he now ran through the trenches, and on his way to the Redan accoutred himself with the arms and appointments of a slain linesman. With all haste he joined Lieutenant Ranken and ascended the parapet, where, after firing for a time and throwing heavy stones with his strong arm at any Russians who dared to show themselves; he was killed. He fell on the crest of the work and then pitched headlong into the ditch followed by a mass of earth which crushed him beneath it.

That so few casualties occurred among the sappers of the storming party is attributable to the manner in which Lieutenant Ranken directed the placement of the ladders. More serious however were the casualties in the batteries and parallels. Those struck in the trenches were—

Lance-corporal John Fulton¹—wounded severely in the left hand by the splinter of a shell, whilst in the fifth parallel.

¹ When lying wounded, sergeant-major Jamieson passed him. "Well, sergeant-major," said he, holding up his shattered hand, "this will ruin Chelsea Hospital!" meaning, in a satirical sense, that the *extravagant* pension he would receive would throw the hospital into a state of insolvency. He was discharged from the corps with a pension of eightpence a-day.

Private William Brine—killed in front of the 21-gun battery. Was struck in both arms, and also disembowelled.

" Edward Lewis—right arm shot off—amputation was performed in the trenches, and repeated a few days after in the camp. Died 18th September.

" John Gregory—wounded dangerously in the back. Died 17th Sept.

" Jesse Head—wounded severely in the back.

The assault having failed, Captain Montagu, who was in command of the royal engineer department for the day, employed in the afternoon the sappers and working party at his disposal, in continuing the right advance sap in the direction of a rifle pit which this day's operations had embraced in the British circumvallation. So wearied and stricken were the Russians by their exertions and losses that they permitted the approach to proceed unmolested.

In the night of the 8th no sappers were told off to the left attack, but thirty-six non-commissioned officers and men were distributed to the lines on the right. Three sappers in charge of one hundred men of the 42nd Highlanders were thrown into the right advanced sap and prolonged it by staking and filling one hundred gabions, in which they were only slightly interrupted by the enemy. The remainder of the brigades and working parties bustling among the parallels and batteries, repaired the embrasures, merlons, and platforms. Corporal John Ross was in charge of a party mending the embrasures of the quarry battery.

While these services were in progress fires broke out in several places in Sebastopol, and magazines blew up which cast at intervals over the doomed fortress a dismal glare of illumination, which was again deadened by clouds of thick smoke hanging heavily in the air. Conceiving that these were the throes of a general wreck, indications in fact of the desperation with which the enemy was resigning his stronghold, corporal John Ross who has more than once been noticed for his bravery at the siege, went forward to test the accuracy of his surmises and search for two missing sappers who had been left behind in the retreat. It was a beautiful night, mild and starlight. Four or five explosions had just taken place, which in the

corporal's view were ominous of the grave events transpiring in the fortress. As it was not usual to interfere with the sappers in the trenches go where they would, Ross had no trouble to pass the pickets and sentries in the fifth parallel, and a few more paces found him in the last approach. An artillery officer was there looking earnestly over the parapet, but the corporal moved silently along stepping over the bodies of the wounded, who in numbers had crawled into the trench after the failure. Inquiring hastily whether they had observed any Russian pickets lately, he was told they had been withdrawn early in the night. "Have you seen any wounded sapper lying outside?" he asked. "One straight to the front under the abattis," was the reply of an infantry man who had witnessed his struggles. With this information Ross went on. It was about a quarter-past twelve o'clock when he issued from the outlet of the sap and directed his course to the Redan. The dead were strewn thickly on the open, and the wounded were writhing helplessly. When near the abattis another mine was sprung in the fortress. Ross stopped, for the coolest minds in extreme danger hesitate to make an useless venture. The bursting of magazines and the blowing up of forts and fortifications impressed him with the necessity of caution; and lying still in a momentary reverie, he was again shook into activity by falling stones from the explosions. On his hands and knees over torn ground, cannon balls, fragments of shells, and decomposing remains, he crept noiselessly on. Under the abattis he found his comrade private Carswell and a sergeant of the rifles. The meeting in such a spot was hurried, but as cordial as friendship and imminent hazard could make it. A few interrogatories and answers were interchanged which verified the report relative to the withdrawal of the Russian outposts. "That's well," said Ross, calmly. "I'm going into the Redan, and if all goes right I shall be back directly and have you taken to camp." With them Ross left his flask of rum and water, and moved away. "Thanks—God speed you!" reached his ears in whispers as he glided ahead cheered by the hope that Providence, which had hitherto miraculously saved him from hurt or

harm, would extend to him in this adventure the same gracious protection. As the distance between him and the fortress lessened his daring increased, and without a tremor to disturb the firmness of his purpose, he found himself at the brink of the ditch. For a short time he lay and listened. Russians might have been there plundering the dead and alarming the dying, but not a soul was astir. Hearing nothing but the groans of the wounded, he slid into the fossé, clambered up the escarp by the ramp made during the storming, and entered the jaws of a broken embrasure on the right of the salient of the Redan. The gun was there but no artillerymen. Yet he pressed his ear in the direction of the interior to discover, if possible, the footsteps of the gunners or the sound of voices. All was silent, and with a burglar's creep, soft and wary but determined, he gained the neck of the aperture. At either side he looked, but nothing started up to show that the batteries were occupied. He looked ahead with straining eyes and onwards; still, nothing could he see but huge broken works, and streams of light shooting from burning buildings. All indeed was quiet save the crackling timbers in the distance, the booming of mines and the falling of houses. The Redan, that furnace of the siege, was indeed deserted and desolate! Being alone and unarmed Ross did not descend into the place to invite a conflict with concealed prowlers; and so after keeping watch for a few minutes in the withered embrasure, he quitted the opening while tongues of lurid flame jetting from clouds of heavy smoke, enabled him to pick his way from the battery without treading on wounded men struggling in dissolution. Charged with the possession of important intelligence he ran across the open, recovering himself with strange celerity as he dropped into shell holes or tripped against obstacles that encumbered the ground; and moving with almost winged haste to the engineer hut, he reported, about a quarter to one o'clock, the result of his self-imposed mission to Captain De Moleyns of the engineers.

The Redan evacuated! This was news indeed, and the captain with a young subaltern, Lieutenant Dumaresq, strode

away to authenticate by a personal visit to the Redan the corporal's report. He was also accompanied by sergeant Landrey, corporal Ross and a few sappers, who were joined in the fifth parallel by some men of the line. On the way the corporal pointed out his wounded comrade and the rifleman. Over the first Ross placed his greatcoat, and Lieutenant Dumaresq took off his peacoat and spread it over the sergeant; at the same time a few of the privates were despatched to the trenches for stretchers. The little band now shot on briskly to the salient. Ross and a line sergeant were in front. When the ditch was gained the party pushed into it, and quickly ascending the escarp by the ramp, they drove through an embrasure into the interior, where, seeing a Russian, the sergeant of the line sprang on him, and seized him as his prisoner. No time was lost by the officers in making a reconnaissance of the place; all sorts of dimensions were taken and a mental inventory of its peculiarities treasured up. Between five and ten minutes the adventurers were in the body of the work, and as explosions were going off every few minutes, the debris from which was falling on them, it was considered wise to return. Ross brought away with him two Russian musquets, the first trophies from the Redan. With a generosity equal to his bravery he gave one to Captain De Moleyns and the other to Lieutenant Dumaresq. On the way back the party sought the wounded men, and as the stretchers had not arrived, Ross bore away poor Carswell and Landrey the rifle sergeant. Of the gallant demeanour of these non-commissioned officers, Captain De Moleyns spoke commendably. The corporal's report, first received with incredulity, was now satisfactorily affirmed, and General Simpson, who had intended to renew the assault at daybreak, gave orders for the re-occupation of the place. At the dawn of the 9th the troops marched unchecked into the Redan and took possession of the two towns which the enemy had evacuated.²

² Sir Harry Jones, in his report of the 9th September, thus wrote of the corporal's exploit:—"General Simpson determined to renew the assault at daybreak the following morning, but during the night a corporal of sappers

"Throughout this long and arduous siege," wrote Sir Harry Jones on the 9th, "the royal sappers and miners have ~~invariably~~ performed the duties required of them in a highly satisfactory manner. Many have been conspicuous for their bravery and coolness under fire. Their names I brought under the notice of the Commander of the Forces, who was pleased to reward them according to the nature of the case.

"The duties of the Adjutant to the royal sappers and miners," adds the General, "have been very efficiently performed by Captain Ewart, who has devoted his best energies to the men."

In the order issued by the Commander-in-Chief, when the occupation of the Redan had become a settled event, occurs this passage:—

"General Simpson avails himself of this opportunity to congratulate and convey his warmest thanks to the general officers, officers, and soldiers of the several divisions, to the royal engineers and artillery, for their cheerful endurance of almost unparalleled hardships and sufferings, and for the unflinching courage and determination which, on so many trying occasions, they have evinced."

So ended a conflict carried through a period of 337 days made up of a freezing winter and a wasting summer. The trenches were nearly nine miles long, and counted 22 batteries on the right and 20 on the left, which, for the final assault, were armed with 116 guns and 85 mortars. In the formation of the works no less than 20,000 gabions, 4,000 fascines, 340,000 sand-bags, 7,413 bread-bags, and a hundred different extemporized expedients had been employed to give them shape and solidity. Some of them were of colossal magnitude and master-pieces of field art. Rearing such formidable structures in rocky ground, amid hardships and catastrophes, harassed by sorties, surprises, and alarms, and opposed by tempests of shell and shot, grape, canister, and Miniés, were exploits of toil and

conceiving that the enemy had retired from the Redan, crept forward and ascertained such to be the case; as soon as this information was received, orders were sent to re-occupy the Redan."

constancy, the lustre of which can never be lessened by any example which history may offer as a parallel ; and when it is considered that the works were run up by men overworked and wearied, oppressed by sickness, privation, and difficulties, and carried on in the presence of an enemy teeming with numbers, inspired by religious fanaticism, and protected by a stupendous array of works backed by an arsenal exhaustless in siege appliances, in artillery, and the engines of war, a day may come when it will be the fashion of the world to speak less of the military achievements of old Greece and Rome, but more of those of England and France.

1855.

SEBASTOPOL.

9th September, 1855—28th January, 1856.

Statistics—Andrew Anderson—Misconduct of the sappers—Non-commissioned officers and men who received honours, appointments, or commissions for their gallantry or useful services—Sergeant Samuel Cole—Field electric telegraph—Private Fox taken prisoner—Exploring the batteries for machines and electric wires—Commence batteries near Fort Paul—Sappers removed to the Karabelnaia—Reinforcements from Gibraltar and England—Driver troop to Scutari—Sapper quarters in the docks—Huts—Companies attached to divisions of the army—Expedition to Kinbourn—Marshal Pelissier's acknowledgment of services of the sappers attached to it—Sir William Codrington assumes the command of the army—Explosion of the great French magazine—Exertions of tenth company in arresting the fire—Gallantry in preserving the Inkermann magazine mill—And removing live shells from the vicinity of the flames—Construction of a magazine for small arm ammunition—Stone bridge over the middle ravine—Barrel causeway across its swampy bottom—Another reinforcement from England.

THE siege concluded, it may not be amiss to afford a statistical recapitulation of matters connected with the contest which concern the royal sappers and miners. From the commencement of the campaign nine companies were sent to Turkey and the Crimea, as also small parties for especial services. Some of the companies served for a period in the unhealthy region of Varna, and detachments were employed on the Danube, at Bucharest, and in Circassia. The united sapper force despatched to the East up to the 9th September, 1855, counted a total of 935 non-commissioned officers, privates, and buglers. Of this number 887 reached the Crimea, the remainder being retained in Bulgaria, Scutari, and Gallipoli for particular services, or on account of sickness which invalidated them to England.

The casualties were as follows:—

	Men.
Killed in the trenches	37
Died of wounds	18
Wounded severely, who survived	42
Wounded slightly	61
Perished by drowning	6
Frozen to death	1
Died from frostbite	4
Found dead	2
Missing, supposed to have perished	3
Died from cholera, diarrhoea, &c.	152
Total	223

Those invalided amounted to 119 non-commissioned officers and men, of whom 4 died in this country and many were discharged, one of whom, private A. McConnell, had lost his feet from frost-bite. Out of a force of 935 of all ranks there were therefore 445 casualties.

None of the corps were killed or wounded at the Alma, Balaklava, or Inkermann. With the exception of a proportion of those who died from cholera, all the rest of the casualties occurred in the Crimea. Nearly all the men that were wounded were struck, strangely enough, on the right side. The men drowned were wrecked in the Black Sea during the storm of the 14th November, 1854. Private James Deacon was frozen to death; corporal Thomas Leonard, lance-corporal Joseph Gordon, and privates Jonas Cole and John Porter died from frost-bite; those found dead were privates A. Anderson¹ and John C. Guy;

¹ Distinguished at the battle of Giurgevo for his gallantry. A fine, handsome soldier, he was admired by both officers and men. When work had to be done, he would toil like a slave to accomplish it; and when duty demanded his services he was never absent. His propensity to drink, however, placed it out of the power of his officers to award him promotion. At the Cape of Good Hope, he earned a medal for his services in the Kaffir war of 1846–47, and received another medal and a second-class prize for his conduct and usefulness at the Great Exhibition of 1851. He was employed in that duty at the instigation of Major Bent, who generously became surety for his good behaviour. Well did he support the Major's recommendation; but on his removal from London at the close of the Exhibition, he soon relapsed into his former habits. His bravery in the battle of Giurgevo is already told; and the decoration of the order of the Medjidie, placed on his breast by Omar Pacha—a distin-

and those missing were privates Thomas Callaghan, John G. Williams and James Thomas. The two former were lost after the battle of the Alma. Suffering from cholera and unable to march—one on the banks of that stream and the other on the Katcha—they were left behind to embark for Scutari, and most probably perished in some miserable nook on the Kalamitean shore. Thomas was sent an invalid from the camp to Balaklava on the 2nd November, 1854, and is supposed to have been nipped by the frost, and died away from the track of men from cold and exhaustion. A strict but fruitless search was set afoot to ascertain their unhappy fate.

Four privates of the corps deserted from its ranks in the Crimea, but none of them entered the service of the enemy. Intrusted as the sappers were with important duties, and its privates even invested with authority in the trenches, it may occasion surprise that the self-respect arising from these circumstances did not check them from the commission of gross delinquencies. Like their brothers in arms, too many of them fell by similar temptations, and the inordinate use of strong drinks—an habitual and disgusting practice with several—subjected a large catalogue of offenders to that description of disgrace which the enlightened humanity of the country had, after years of agitation, reduced to a few stripes. It was found one of the chief difficulties of command to arrest the pitch to which the vice had risen, and Colonel Gordon tried the effect of a monthly *exposé*. After showing that for three months ending 30th November out of an average force of 687 non-commissioned officers and men no less than 11 in every 100 per month had been awarded punishments of various kinds, he thus wrote in his orders of the 3rd December, 1855:—"Such a record would bring shame on any corps on home service. In the field it brings positive disgrace on the royal sappers and miners. Till the flood of drunkenness has abated," continued the Colonel, "and there remains no longer a necessity of recording our

never before conferred on one of so humble a rank—failed to inspire him with sufficient pride to curb his excesses; and there is reason to fear, that his melancholy fate was brought on by his infatuated indulgence.

disgrace as a means of helping to remove it, a similar return to the above will be published monthly." And what was the result? The habit of intoxication still went on; and in March, 1856, when the last account was published, the number of instances of drunkenness out of a strength of 766 of all ranks had swelled to 16 in every 100 men per month, or 4 daily, on the whole strength. A public charge like this it would have been unjust to suppress; and though the light it affords is rather a lurid one, it may still serve as a beacon to avoid, in future, the shoals of excess, and lead to the improvement which the stern confessions of history are intended to effect. Though the truth is stated, there is no ground for supposing that the corps was more addicted to intemperance than other troops. Its offences had been recorded with almost conscientious scrupulousness; and if in other regiments the same strictness has been followed, a comparison, could such be instituted, would not yield a result unfavourable to the sappers.

As a rider to these frailties, let it be repeated how heroic was the general demeanour of the men in the batteries and trenches. In the order alluded to occur these sentiments:—"Colonel Gordon has great satisfaction in knowing there are plenty of men who have nobly done their duty in the field, and who have conducted themselves well amidst the prevailing drunkenness. . . . Great is their merit. Their good example is more than ever required, and Colonel Gordon thanks them; and he begs them to persevere in upholding the reputation of the corps." These pages testify to many individual cases. Not a few were rewarded with pecuniary grants; many received promotion, and a chosen number received medals and honours for their gallant services before Sebastopol.

Those upon whom were bestowed medals for "distinguished service in the field," accompanied by gratuities, were:—

Colour-sergeant Henry McDonald . . .	annuity of 20 <i>l.</i> a-year.
" Alexander M. McLeod . . .	gratuity of 15 <i>l.</i>
Corporal Samuel Cole*	" 10 <i>l.</i>

* A few cases occurred in which the rank of sergeant was attained by a junior non-commissioned officer within eighteen months. Samuel Cole is

2nd corporal John Paul	gratuity of	10 <i>l</i> .
" William Trimble	"	10 <i>l</i> .
Lance-corporal Joseph T. Collins	"	5 <i>l</i> .
" William Jenkins	"	5 <i>l</i> .
" Charles Rinhy	"	5 <i>l</i> .
Private William Harvey	"	5 <i>l</i> .
" William Orr	"	5 <i>l</i> .
" William Bruce	"	5 <i>l</i> .
" Alexander McCaughey	"	5 <i>l</i> .
" James Moncur	"	5 <i>l</i> .
" Neil McInnes	"	5 <i>l</i> .
" Andrew Fairservice	"	5 <i>l</i> .

Those who obtained the French military war medal "for valour and discipline," were :—

Colour-sergeant Kester Knight.
 Sergeant John McMurphy.
 Corporal John Ross.
 „ Robert Hanson.
 „ William J. Lendrum.
 2nd corporal Walter Conning.
 Private John Perie.

The non-commissioned officers created Knights of the Imperial Order of the Legion of Honour of France by the Emperor Napoleon III., as a mark of His Imperial Majesty's approbation of their distinguished services before the enemy during the war, were :—

Colour-sergeant Henry McDonald.
 „ John Landrey.
 „ Kester Knight.
 „ George Jarvis.
 „ Peter Leitch.
 „ Joseph J. Stanton.
 Sergeant John Paul.
 „ Samuel Cole.
 Corporal Joseph T. Collins.

instance. He went to the Crimea a young second corporal, but so conspicuous was his conduct in the trenches, and so sustained his usefulness and gallantry, that besides the grant of pecuniary rewards, a special medal for distinguished service, and the Order of the Legion of Honour, he was promoted successively to the ranks of corporal and sergeant. Of him Colonel Gordon wrote on the 6th December, 1855, that he was one of the "most distinguished in the corps for bravery and had just received a step of rank"—that of sergeant—"for very distinguished service in the field."

Those decorated by Her Majesty with the Victoria Cross for acts of bravery performed by them before the enemy, were:—

Corporal John Ross.

" William J. Lendrim.

Private John Perie.

Noted for their care and intelligence in the discharge of difficult and trying duty, the following non-commissioned officers, recommended by Sir Harry Jones, were appointed by Lord Panmure to be conductors of engineer stores, with the salaries affixed to their names.

Colour-sergeant George Pringle . . .	100 <i>l.</i> a-year.
" Alexander M. McLeod . . .	90 <i>l.</i> "
Sergeant William Dickson	80 <i>l.</i> "
Colour-sergeant Benjamin Castledine . .	80 <i>l.</i> "
" George Wohlmann	70 <i>l.</i> "

To hold these non-combatant situations, they were, so to speak, *seconded*, and retained possession of their regimental allowances; but when no longer required for the appointments, they fell back into their old ranks in the corps.

Sergeant William Sargent, who from the first had been employed as a military foreman, in carrying out the works at Constantinople and other places on the Bosphorus, was discharged from the sappers, and confirmed as a civil foreman of works in the royal engineer department.

And to this list must be added the names of non-commissioned officers who were commissioned by Her Majesty into the Land Transport Corps. They were—

Colour-sergeant James Falkner ^a . .	} as Cornets.
" John Landrey	
" James Spry	
" George Wohlmann	
" Cornelius Godfrey	
" William Lambert	as Quartermaster.

When the honour was conferred on the first two sergeants, Colonel Gordon of the engineers thus alluded to it in his

^a From a feeling of kindness, as modest as generous in its exercise, Major Ranken of the engineers, who fell soon after, buried under the ruins of the White Barracks in the Karabelnaia, presented Cornet Falkner with a grey pouy. In asking his acceptance of it, the Major thus concluded his note: "I feel a pleasure in offering it to you as I am enabled thereby to mark my sense of your good services while attached to the company under my command."

brigade orders of the 1st December, 1855, "These are the first non-commissioned officers of sappers who have been rewarded with commissions for their good and distinguished conduct in the field. Having contributed by good conduct and gallant bearing to raise the reputation of the corps of royal sappers and miners, they carry with them to the honourable positions to which they have been raised, the best wishes of Colonel Gordon and of all the corps under his command."

The roll of non-commissioned officers and men who deserved substantial appreciation for their merits might have been extended *ad infinitum*, but the distinctions offered by the Government and the French Emperor were confined to the limits which these few paragraphs detail.

Here may be a fit place to allude to an institution of the war, suggested by Major-General Wylde, which was found an important auxiliary to the army. The field electric telegraph, used for the first time in any campaign, came first into operation a few months after the great storm of November, 1854, and was placed under the direction of Lieutenant Stopford. From him it passed, in the early summer, to Captain F. Du Cane, and in September, 1855, to Lieutenant Fisher, Captain Du Cane having been compelled to relinquish it on account of ill health.

By degrees the ramification of the lines extended to eight stations, each connected with the other by under-ground wires, laid in furrows about eighteen inches deep, and afterwards covered up. The several lines made up an aggregate length of nearly 24 miles of current. The stations were at Headquarters, Kasatch, the Monastery, Engineer park, Right attack, Light division, Kadikoi, and Balaklava. Various obstacles occurred to delay the establishment of the stations, such as snow storms, hard frosts, and heavy rains; the failure of the plough to dig the trenches in which to deposit the wires, and the consequent resort to the employment of working parties, already weakened by overwork, insufficient diet, a dreadful winter, and unnumbered hardships and trials. These, however, at length, were to some extent overcome; and the first telegraphic communication was opened between Lord Raglan's

head-quarters and Kadikoi, a distance of three miles, on the 7th March. Other stations opened in quick succession, and that formed in one of the caves between the two first parallels of the right and left attacks commenced work on the 8th April, 1855.

The offices were the purest make-shifts—the strongest contrasts possible to the stately establishments of home. Those of the engineer park and light division were in bell tents; that near St. George's Monastery was at an inn which, when the monks were the occupants of that isolated cloister, formed a sort of refectory for those abstemious celibates. Four others were in huts, and the last was in a small cave in the Woronzoff ravine, partially protected from a daily fire by a traverse of sand-bags. Private East, both night and day, in storm, rain, and wasting heat, occupied alone that dismal recess, sleeping, when he could get the chance, on a shelf of rock. So used indeed had he become to it that few men in camp were more indifferent to comfort, few less disposed to cavil with disadvantages and hardships than he.

Until the beginning of August the telegraph was exclusively worked by sappers selected from the companies in the Crimea, who were taught the use of the instruments and signals by corporal Peter Fraser—a pupil of the establishment at Lothbury. The instruction was necessarily hurried, but the men proved to be so quick and intelligent that they were ready to commence their novel duties when the first station was opened. As manipulators most of them were very good, particularly the buglers, two of whom, John Filkin and William Algar, could read sixteen and a half words in a minute! From the single needle instrument, which was used at all the stations, this was regarded as a feat in telegraphy, and probably the best manipulator in London would scarcely come up to this test of sharpness of sight and fleetness of reading.

Two sappers generally were attached to each station, but two or three corporals and as many buglers attended to the necessities of head-quarters. Each office had a single needle instrument, alarm, and batteries, besides a supply of zinc-plates, acids, &c. The duties of the sappers comprised the manipula-

tion of the instruments, attending to the batteries, sending, receiving, and writing all messages and despatches; recording such as required to be noted, and filing others. Though carried on amid the excitements and turmoil inseparable from war, and the pressure arising from haste and a variety of complicated contingencies and emergencies, the details of the system, including the registry, check, and examination, were, all things considered, very complete. Two orderlies from regiments of the line were allotted to each station to take the messages to their destination; at the head-quarters there were three.

The messages were on every class of subject from the affectionate inquiries of anxious parents and friends to the stern orders for bombardment or assault. Nothing that was required to be communicated rapidly—from those who had authoritative access to the offices—was conveyed by any other agency than the field telegraph. All despatches to and from the Commander-in-chief on matters in which secrecy was essential were in numeral cypher; all else were couched in brief but expressive English. An exposition of all the vouchers and messages which passed in and out of the different offices would form a curious episode in the history of the war. In August, 1855, one of the months of the siege in which the cannonading was the hottest, the number of messages received at head-quarters was 464, and the number sent 402, being an average respectively of 15 and 13 a-day. The station in the caves of the Woronzoff ravine, which opened on the 8th April, 1855, received, up to the conclusion of the siege, 160 messages, or one a-day. To keep on perpetual watch for this singular dispatch was enough to wear out the most exemplary patience; and when to this tiresome experience was added the miseries of a dank vapoury hole in winter and a broiling furnace in summer, it may occasion but little wonder that the occupant of the cave was not very remarkable for sobriety. Sergeant Anderson, the senior non-commissioned officer at the instruments, was stationed at St. George's Monastery. He received the despatches from England through the submarine line from Varna, and telegraphed them to head-quarters. In like manner he received those from Lord Raglan

and the staff, and also the Sardinian Commander-in-chief, through the head-quarter office, and conveyed them to the submarine line for communication by way of Varna to England and elsewhere. Corporal Fraser, the chief telegraphist, was in charge of the manipulators at the head-quarter office. The extra allowances paid to the sappers for this duty ranged from 1s. to 5s. a-day. Those who received the last rate in succession were sergeants Anderson and Montgomery and corporal Fraser.

Every day the sappers were at the instruments, and each, turn about, continued at work throughout the night. It was, however, permitted to the men on night duty to snatch, if they could, any intervals which might offer for rest; and so rolling themselves up in their blankets they commenced a series of forty winks in front of their apparatus. No dependence could be placed on a single minute for tranquillity; for in all probability just as the sapper had made himself as comfortable as his limited means allowed, and he was beginning to close his drowsy lids in grateful unconsciousness, he was again forced to his seat by the alarm bell, which continued its shrill noise until the disturbed manipulator communicated with the station from whence the ringing originated. This however was barely regarded as a hardship; but it really amounted to one when the sappers who had been relieved from duty were driven from their slumbers to assist their comrades. Delays were inadmissible, and no inconvenience, circumstance, or right of remission from labour, could be pleaded as an excuse to stave off applications which pressed for communication. Disturbances like this occurred as many as three or four times in a night, and to shake oneself from sleep when nature was well nigh spent for the want of it, demanded a strength of effort and purpose which few men would be willing to exercise. And yet the operators were seldom indisposed to give their services however unreasonable or litigious were the calls for them. What with constant watching, the irritating interruptions of sleep, the tedious care to prevent error, coupled with the anxieties which each felt for the success of a new and rather tender under-

taking, it is somewhat remarkable that none of the sappers broke down from their vigils and overwork.

It not unfrequently happened that the gutta-percha covered wire which carried the electric stream from station to station became broken. The causes were various and even curious. Digging in the neighbourhood to find roots for fuel, or by traffic, was a common cause of interruption; burying horses' offal, &c. was another. Often the line was cut by designing men, who, having abstracted a few yards of it, withdrew the wire from its covering and used the hollow gutta-percha tubing for pipe stems! Once the current was stopped on the Kazatch line by the industry of an insidious field mouse. With great difficulty the site of the disconnection was detected, when baring the line, it was found that the wire, which passed through a nest of mice, was bitten in two by the matron of the haunt. Occasionally accidents to the line took place during bombardments by round shot and splinters of shells. Not without some trouble were the lines repaired. Two interesting instances have already appeared in the narrative.

From August the telegraph was mutually worked by civilians and sappers. The Government having sent out a civil superintendent and ten civil telegraph clerks to the Crimea, they were added to the staff under Captain Du Cane, who distributed them to the several stations—one sapper and one civilian to each. The men whose services were thus dispensed with, and who had assisted to give efficiency by their care and attention to a delicate experiment, were sent into the trenches. It was a needless arrangement this, for the sappers at the time were performing the duty with every satisfaction. Whatever may have induced the incorporation of the civil element with an undertaking that had been organized and carried out as a military duty, it is enough to show the interest with which this scientific appendage to the army was held by the Ministry at home; and whatever success may have resulted from the combination of the two elements in working the field telegraph, is due equally to the intelligence and efficiency of each, but more so to the officers whose anxious superintend-

ence and incessant watchfulness, gave vigour and all but perfection to the system they devised and directed. In time the entire charge of the field telegraph was confined to the sappers, and the civilians on being removed joined the submarine branch.

The officers who commanded the sappers on this duty have thus spoken of their aptitude and labours:—

Lieutenant Stopford writes: "The sappers showed great quickness in learning the use of the instrument, although not one of the men, except corporal Fraser, had any knowledge or indeed had seen the single needle instrument before; therefore to him is due the credit of teaching all the manipulators. Sergeant Anderson was in charge of the telegraph party and one of the first to learn the use and working of the instrument." When reporting upon the operations generally, Captain Du Cane commended them for their exertions in these words: "I consider great credit is due to the sappers for the prompt manner in which the repairs"—to the wires—"were executed." Elsewhere in his report he mentioned, "that the sappers evinced considerable intelligence in working the telegraph, and although in one or two instances misconduct occurred, yet on the whole they discharged their duties in a satisfactory and efficient manner." "The working of the telegraph," says Lieutenant Fisher, "was done in the most satisfactory manner by men of the royal sappers and miners, many of whom, more especially the buglers (four), showed a very great aptitude for learning the manipulatory process. Fifteen of the corps had been wholly initiated in the art, and," continues the officer, "from the great pains taken by corporal Peter Fraser in their instruction many of the men and boys have become excellent telegraphists."

Early in the morning of the 9th two sappers actuated by an inquisitive feeling approached within a short distance of Fort Nicholas, which was still in possession of the enemy. One was a bugler, the other a private. The latter had armed himself with a Russian musket. Having satisfied their curiosity they were waiting a chance conveyance to take them over to the

English side of the dock-yard creek. Private George Fox descriing a well-laden boat in the distance went in its direction. It pulled towards him, and the sailors stepping to land courteously gave him a place among them. They turned out to be Russians, and Fox was thus a prisoner of war. After seeing the boat push off and waiting about an hour the bugler returned to camp. Rejoining the corps by exchange on the 26th January, 1856, Fox went into hospital five days after and died on the 14th February. Worthless as a man from his dissipated habits, Colonel Gordon however placed it on record that he "was a most valuable sapper in the trenches." He was the only sapper taken prisoner during the war.

After the troops had occupied the Redan, small parties under Major Montagu and Lieutenant Lennox of the engineers, and Captain Penn of the royal artillery, were employed in examining the ground for explosive machines and searching for galvanic wires leading to magazines. Several were discovered in different places where it was expected the assailants would enter in storming the works.

Detachments of sappers, assisted by working parties and sailors, commenced on the evening of the 11th the construction of a battery for two ninety-five cwt. guns on the right of St. Paul's battery. Some little progress had been made in rearing it, when the work was abandoned. A fortnight later a more extensive battery near the ruins of Fort Paul was begun, for ten guns to sustain a contest with Fort Sivernaia on the opposite side of the harbour. It was built in a bakery, the rear wall having been thrown down, leaving the under portion of it as a parapet, while the front wall, retained as a mask which a few shots would have crumbled into ruins, concealed the nature of the battery from the enemy. The firing from the northern works was nevertheless pretty brisk, but harmless, and the work proceeded steadily. Other objects, however, being determined on, the battery, though its embrasures were partly cut and revetted, was never armed.

In the meantime the eighth company and a detachment of the 3rd Buffs moved into the Karabelnaia to be employed in the

destruction of the docks, and were quartered in the storehouses of the dockyard, which being exposed to the Russian fire from across the water, was occasionally visited by the intrusion of shot. Two or three of these missiles plunged into the barrack-room but providentially not a man was injured by them.

Demands for men became so urgent as the siege progressed, that, while waiting for reinforcements from England, Gibraltar was called upon to furnish as many sappers as possible from its effective rolls. Accordingly on the 29th August, 48 men under Lieutenant Cumberland embarked on board the 'Orinoco,' and landed at Sebastopol six days after its fall.

Under Lieutenant Edwards, 51 non-commissioned officers and men from Chatham arrived at Balaklava in the 'Adelaide' on the 18th September; and then followed on the 5th October, the disembarkation at Scutari of the twenty-third company—93 strong—under Captain Siborne. This was the driver troop, a community of little jockeys, light in weight and sprightly in action, whose antecedents as ostlers, cabbies, grooms, and carters, rendered them so ductile in military equestrianism that, when inspected at Woolwich on the 17th August by Sir John Burgoyne, he pronounced their evolutions and the management of their horses to be very commendable. Captain Siborne had the merit of achieving this proficiency, as his adjutant did not join the troop until its arrival at Scutari. Eighty-eight horses were sent out in the 'Assistance' steamer with the company, nine of which were killed before the landing of the drivers. The stations of the troop were at Haida Pasha, Kulalee, and Scutari. The total force despatched to the East up to this time counted 1,127 non-commissioned officers and men.

Late in September the eighth company was removed from the docks. A month later the eleventh company was sent to the Karabelnaia, and took possession of the same store for a barrack. It was a cold and cheerless fabric, built on the wharf of the creek. At this time the fire upon it was considerably diminished. Two or three companies of the 18th regiment deputed to work with the sappers occupied quarters in the same range. These were the only troops except the allies quartered,

at one time, in the dockyard. The French miners were cantoned in stores at the West end—the English sappers at the East. In the selection of barracks there was no occasion for national jealousies or bickerings, for neither district was a Belgravia; that of the French only possessing the designation without its style or a tithing of its comfort.

Working from the experience of the previous winter the Government entered into contracts in the summer for the immediate provision of materials for hutting the army in the Crimea. For a supply of such magnitude a forest was scarcely sufficient, and no less than thirty-four vessels of good tonnage were freighted with the residences. Between the 31st August and 10th October, all the ships were at sea, accompanied by 67 non-commissioned officers and men, chiefly carpenters, in charge. In the 'Cochrane' only one sapper had embarked, but in all the rest two each. The first vessels arrived on the 13th October luckily when the pressure in front had ceased, and then followed others in quick succession. Second corporal R. Lewis was appointed under the authority of a general order issuer of huts with an allowance of 2s. 6d. a-day from the 20th October. Two of the hutmen did not arrive until about the 31st December.

Between the erection of the huts and the demolition of the docks, the business of the sappers was principally divided. There were besides many other services which claimed their attention, such as dismantling the trenches and batteries, mending the roads, repairing hospitals, wharves, piers, waggons, &c., and surveying. A company was attached to each infantry division⁴ of the army to attend to its exigencies. It was not however removed from its original hutting ground, except when the requirements of the division rendered it desirable. As this arrangement necessarily limited the command of the chief engineers in the direction of the energies of the sappers so far as any work not a divisional one was concerned, an explanatory instruction soon after followed.⁵ Each company was considered as under the orders of the general commanding the

⁴ General Order, 24th October, 1855.

⁵ General Order, 20th November, 1855.

division, and to preserve that command, the sappers when wanted for a public duty, were obtained for its performance on the authority of the commander of the forces communicated to the general officers of the respective divisions. In this way there was no check to the fullest employment of the corps, and the identification of particular companies with particular divisions was not without advantage.

With the allied expedition sent to attack Kinbourn in October there were sixty non-commissioned officers and men of the corps under Major Bent of the engineers. The British contingent was commanded by Brigadier-General the Hon. A. Spencer. On the 15th the disembarkation took place on a tongue of land stretching into the sea; and the troops were halted at a spot, which from its broken features and the presence of small patches of morass in its front, rendered it acceptable for a defensive position. Encamped on salient hillocks, the regiments were concealed from Russian observation by spreading their canvas on the reverse of the declivities. The line, traced by Major Bent and a French engineer, took advantage of the abounding irregularities of the ground, and was closed on the left by a species of hornwork with its two salients rising from the summits of two small mounds, and its flanks resting on the Licame sea. Into this "keep" it was intended, in the event of any mischance, that the troops should retire and hold it by intrepid fighting till the last man had returned to the ships. On the right of the line two small detached works were also traced on commanding heights to flank the front of the position and to be defended by pickets. In the night of the 15th the intrenchments commenced by each regiment throwing up the necessary cover in its immediate front. The "keep" and the outworks were also advanced; and wells, which produced excellent water at a depth of seven feet, were also sunk. Under the superintendence of the royal engineers and the company of sappers, the field defences, adequate for the protection of kneeling musketeers, were finished on the 17th. The excavation was six feet wide and three deep in which a banquette was formed three feet broad. When the land arrange-

ments were perfected, the allied fleet opened a sharp fire on the old masonry fort and its two sand redoubts, mounting respectively 60, 11, and 9 pieces of artillery. A block of buildings in the fortress was speedily in flames, the old ramparts fell down, many guns were destroyed, and the carriages upon which they were mounted were shivered and disabled. To an attack so irresistibly conducted, the garrison about 1,200 strong soon capitulated with the loss of 60 killed and wounded, while the casualties in the Anglo-French fleet were insignificant. On the 20th the troops, none of whom took part in the fight, moved to the village; and on the following day, when the main body of the expedition marched to enforce a reconnaissance of the country, Major Bent, left in charge of the camp, set to work to repair the damaged barracks. At this and kindred services in which the skill of artificers was needed, the sappers laboured in unison with the French, and were warmly complimented for their "intelligence, zeal, and activity," by the French general in chief. Major Bent and his company embarked on board the 'Indian' on the 29th October, anchored at Kazatch 2nd November, and soon after landed to share in the general employments of the camp. Their return to Sebastopol was followed by a communication from Marshal Pélissier, a copy of which is added, acknowledging the co-operation of the English with the French sappers in the restorations at Kinbourn.

Armée d'Orient.

"Grand Quartier Général à Sébastopol,
le 7 Novembre, 1855.

Etat Major Général,

Nu. 816,

Au sujet de la
brigade du Général Spencer.

"MON CHER GÉNÉRAL,

"LE GÉNÉRAL BAZAINE m'a prié de vous exprimer combien il a eu à se louer de ses relations de service avec le Brigadier-Général Spencer, et de la conduite des beaux régiments composant la brigade placée sous ses ordres. Les relations les plus amicales n'ont pas cessées un instant de régner dans les deux brigades, et les soldats du Génie des deux armées ont travaillé avec le plus grand ensemble à la réédification de la forteresse de Kinbourn. Je dois vous recommander particulièrement le Major Bent, du corps Royal des Ingénieurs, qui a dirigé avec beaucoup d'intelligence le travaux qu'il a eu à faire exécuter.

"Veuillez agréer, mon cher Général, l'assurance de ma haute considération, et de mon affectueux dévouement.

"Le Maréchal Commandant-en-Chef,

(Signed)

"A. PÉLISSIER.

"Monsieur le Général-en-Chef
de l'armée Anglaise."

[TRANSLATION.

[TRANSLATION.]

“ *Head-Quarters, Sebastopol,*
November 7th.

“ MY DEAR GENERAL,

“ GENERAL BAZAINE has begged me to express to you how much he has to congratulate himself on his military services with Brigadier-General Spencer, and with the conduct of the splendid regiments placed under his orders.

“ The most amicable arrangements have not for an instant ceased to exist in the two brigades, and the soldiers of engineers of the two armies have worked together with the greatest cordiality at the restoration of the fortress of Kinbourn. I must particularly recommend to you Major Bent, royal engineers, who has directed with great intelligence the works which he has had to execute.

“ Pray receive, my dear General, the assurance of my high consideration and my affectionate devotion.

“ The Marshal Commanding-in-Chief,

(Signed) “ A. PÉLISSIER

“ *The General in Command of the*
English Army.”

General Sir James Simpson, who had commanded the army since the death of Lord Raglan, resigned his high office on the 11th, and was succeeded by General Sir William Codrington.

The great Freuch magazine on the brow of the Ravin du Carénage blew up on the 15th November. For miles the ground was convulsed by the explosion as if an earthquake had shaken the land, and in the vicinity of the devastation hill and ravine were covered with the black dust of the gunpowder as if the area were the approach to another Erebus. Shot, carcasses, rockets, and shells, with their myriad splinters, fell in a terrible shower breaking up tents, collapsing stables, throwing into ruins store-sheds and hospitals, burning huts and siege materials, and striking down men at a considerable distance from the scene. The number of officers and soldiers killed and wounded were as many as might have occurred in a sharp action. Bugles were sounded to form a general parade, and the troops drawn aside to a neighbouring height looked on in bewildered amazement. The only two of the corps present at the moment of the catastrophe were Lieutenant Brine and sergeant Jarvis, who were inspecting work done at the stables of Captain Travers' small-arm ammunition brigade. That grave explosion blew down the stables and also those of the Y battery, and let loose some four hundred horses which ran wildly over the hills. As soon as the nature of the disaster

had been ascertained, Lieutenant Brine sent his sergeant for the tenth company. It soon arrived with picks, shovels, hooks, &c. ; and, wrote Lieutenant-Colonel Lloyd, "rendered valuable service." The army was then away, and the little band of sappers set to work under the eye of Sir William Codrington to arrest the conflagration. The powder mill at Inkermann was between two fires, and had been greatly injured by the concussion. But little danger was apprehended from the one on the valley side of it, because the ravine intervened ; but some burning shells having penetrated a number of old French huts beyond the magazine, the little settlement was soon in flames, and as the wind was blowing in the direction of the mill it was a matter of first moment to stay the spread of the conflagration and render the magazine safe. To these duties the greater portion of the company was detailed. By digging a trench around the burning locality and throwing the excavated earth on the fire it thus became isolated, and the flames were gradually reduced by tearing down the planking and beams and removing them to a distance. Strong parties of the line, sent from the heights, working by reliefs, also assisted to extinguish the burning mass, and succeeded in preventing a repetition of the calamity.

Meanwhile the powder mill, on which all eyes were fixed, was scaled by some gallant fellows risking a jeopardy it was exciting to witness. Lieutenant Brine, who was directed to superintend the arrangements for subduing the fire, and to devise means for succouring the magazine, ordered sergeant Jarvis and corporal Osment to ascend it. Without hesitation they did so, followed by other sappers and Major Grant of the artillery and Lieutenant Hope 7th Fusiliers. Sparks were falling on them like pyrotechnic rain, and shells and rockets were still bursting, throwing their splinters and burning fragments in that perilous direction. With wet blankets handed to them from below they "promptly" covered the roof of the magazine and only gave up the task when the officers were convinced that further exertions were unnecessary. Of the brave and ready conduct of corporal Osment, Major Grant reported most highly

to Lieutenant Brine, and he was therefore selected to protect the entrance to the magazine which, facing the flames, was most likely to take fire and yield to unforeseen disaster. At once he covered it with wet blankets suspended from posts, and building against it a wall of sand-bags, further protected it in front by a sand-bag traverse. This done, all alarm was finally allayed by Lieutenant Brine reporting to Sir William Codrington the perfect security of the mill.

When the magazine blew up, some of the company were working at a stone bridge in the ravine about 300 yards distant, and escaped without injury, while several of the line who were assisting, were killed and wounded. The party joined the company as soon as it was perceived to be mustered for duty in front of the huts of the 33rd regiment. Sir William Codrington observing the fire sweeping on to the right of the siege train, asked for volunteers to extinguish it. Several daring fellows answered the call and were soon in the heart of the flames tearing down the burning tents; but as this service did not seem to be of much profit in the presence of more imminent danger, an artillery officer enlisted their exertions to remove many box loads of live shells which, packed in the park of the siege train, were imminently exposed; so much so that while bearing them away, one after another ignited and burst, knocking down men, mules and horses, killing some and wounding others. To some excavated hollows where there had been an encampment, about 150 yards off, the shells were taken and buried. The French and soldiers of all corps assisted in the removal; those of the sappers who most distinguished themselves were sergeant James, corporal Enwright, privates William Church, John Burt, and others.

The explosion led to the construction of a very strong magazine on the plateau in rear of the land transport corps with the light division. It was sunk partly in rock six feet deep, and was 24 feet by 12 feet in the clear. The interior was walled with rubble stone, and splinter proofs ten inches square formed the roof, above which was a covering of earth between five and

six feet deep. It was made to contain, if necessary, more than a thousand barrels of small-arm ammunition. Masons and carpenters of the tenth company built it assisted by parties from the 97th regiment, under Lieutenants Brine, R.E., and Hudson, 97th. It was completed on the 14th December, and being a somewhat showy structure of its class, the little details connected with its erection were inscribed on a slab built into the work.

When in command of the light division, Sir William Codrington desirous of adding facilities to the movement of the troops, directed a bridge to be thrown across the middle ravine to connect with the main road. The tenth company, with the assistance of infantry detachments, built it in November under the superintendence of Lieutenant Brine, R.E., who commanded the company. Sergeant Jarvis was his foreman, and corporal Rylatt his principal artificer. The bridge was of stone having one arch of nearly twenty feet span and a roadway of seventeen and a half feet, approached at each end by a long causeway with a gentle descent from the road. The foundations were of ragstone collected in the vicinity, and the piers, of great apparent strength, were formed of white stone from the Redan. The planking was secured to ten baulks, each 24 feet long and 10 inches square, taken from the white barracks in the Karabelnaia. A stout wooden handrail lined both sides of the bridge for convenience and finish. No mortar was used to give solidity to the masonry; and though the rains and melted snows, rushing down the slopes of the ravine, beat with violence against the rubble piers, the bridge stood as firm as a rock, while other temporary structures of the kind were carried away by the flood. On a stone let into one of the piers of this neat specimen of military engineering, was cut this inscription—

Erected

By 10th Company R. S. & M. and Detachments
of the Light Division, under
the superintendence of Lieut. Fred.
Brine, R.E. Commenced and finished
November, 1855.

In the same ravine, more towards its head, was constructed,

in January, another bridge, unique and picturesque, under the direction of Lieutenant Brine, by the tenth company and parties of the line. Sergeant Jarvis and corporal Luly had the superintendence of the work. The bridge was to open a readier communication between the first and second brigades of the light division, encamped on opposite heights. It was formed of pork barrels two feet eight inches long and two feet at the swell, easily procured, but greatly inferior to porter barrels inasmuch as they were not iron hooped. No excavation was made, but the barrels were laid along the swampy bottom of the ravine, transversely in the centre and vertically at the ends. The upright barrels, formed, so to speak, the buttresses, fifty-four being on the first brigade side and thirty-six on the second. This arrangement appears to require explanation. For the former there were five barrels placed for a base and seven for the latter, overlaid by another row, which, pushing well into the broken slopes of the valley, took eleven barrels for the first and eighteen for the second. This was the nature of the formation at both sides; but, to make the bottoms firmer, a couple of barrels were introduced at each end and the spaces thus enclosed were made solid with earth. The centre division took 168 barrels, which were laid heads to the stream on their swells, end to end, three in a row, with another layer, of equal number, above them. Strips of iron hoop were nailed on the casks through the length of the bridge, and their steadiness was further assisted by filling in the interstices with earth and small stones. The bridge, intended for foot-passengers and equestrians, was 118 feet long and 8 feet wide, with a cross-braced hand-rail rising more than 3 feet above its level supported by six struts sunk into the ground. Heavy stones of large and irregular sizes were built on the edges of the structure, between which 18 inches of metalling was strewn over the bridge, as ballast to sustain it in position. Small roadways, about 10 feet broad, were made to and from this rustic causeway. If baulks could have been promptly procured, the bridge would have been constructed very differently; but the existence of barrels in great numbers offered the best chance of its speedy formation,

which was effected in six days. Its strength was proved by passing over it a 9-pounder field-piece, which was borne without the barrels evincing any signs of weakness, and it resisted with unexpected firmness the dashing torrent that in heavy storms poured down the ravine.

A further reinforcement of 150 non-commissioned officers and men, under the command of Captain Lambert with 29 horses, reached the seat of war on the 28th January, 1856, in the 'Indiana.' The bulk of the detachment sailed for Balaklava, leaving 23 drivers who joined the field equipment troop at Scutari. Only 15 of the horses landed, 11 having died or been killed on the voyage and 3 left at Gibraltar. The total force of sappers, which up to this date had landed in the East, was 1,344 of all ranks.

1855-56.

13th September—1st March.

DEMOLITIONS AT SEBASTOPOL.

Testing the authenticity of some Russian plans concerning the docks—Force employed in the demolition—Situation of the docks—Their magnitude and strength—The operations—Difficulties encountered in their execution by storms and frosts—Labours and hardships of the miners—The explosions—Destruction of the docks—Accidents; intrepid exertions of corporal Cray—Poisonous gas in a gallery; prompt efforts to rescue the sufferers—Shelling the docks while the demolitions were proceeding—Sir William Codrington's dispatch reporting the success of the operations—Also Colonel Lloyd's report—The White Barracks—Their destruction—Death of Major Ranken; notice of conduct of second corporal Baker.

MEANWHILE the mining of the docks proceeded. On the 13th September, one sergeant and nine sappers with some line miners only were employed; but their efforts were mainly directed to prove the authenticity of some Russian plans which had fallen into our hands when the allies first ascended the heights. A few shafts had been excavated in different places behind the revetments when, on the 19th, a subaltern of engineers and forty-two sappers having been detached from the camp, the works spread over a larger area, and were continued till the 24th September, when the service was suspended.

Whether or no these preliminary exertions verified the information which had fallen by the chances of war to the assailants it is needless to inquire, but the resolution had gone forth which doomed the docks to destruction. Accordingly on the 24th October, the sinking of shafts was resumed by forty-eight sappers commanded by a subaltern, who took possession of the large storehouse vacated by the previous detach-

ment. A few companies of the 18th foot were also appointed to assist, a portion of whom from the 2nd of November was domiciled with the sappers. Another reinforcement of forty-eight men of the corps under a subaltern was, about this time, turned into the shafts; and as the demolition progressed, and the line miners began to show expertness in the duty, some of the best of them toiled equally with the sappers in the pits and galleries.

Late in November a demand for more help was met by the addition of sixty sappers to the docks. There were now 156 men of the corps and 150 of the line in the Karabelnaia. A party of linesmen was also sent up daily from the camp, so that the working means at the disposal of the engineers was swelled to a force of about 500 of all ranks. This perhaps was the greatest number employed in the demolitions. Nine hours the men worked daily; but on the 24th November, as important events were evolving which seemed to urge a rapid completion of the service, the whole 24 hours saw reliefs of sturdy men in the mines. Each relief was on duty eight hours. Now it was that serious impediments occurred from the presence of water in the shafts and galleries, but the chief result of these untoward obstacles was the exercise of an energy as extraordinary as continuous. When, however, about the 17th December, the frost set in and the miners suffered severely, night duty, except on pressing occasions, was given up; but to make up for this remission, the sappers and infantry miners toiled in reliefs thirteen hours a-day. In the middle of January, 1856, the 18th foot was relieved by an equal number of the 48th, and the ninth company, brought from Kamara, took the place of the 11th. The second, fourth, and eighth companies of the corps also shared in the operations. Major Nicholson was the superintending engineer.

The docks were situated on the southern extremity of the Karabelnaia creek, and their destruction was a mutual operation between the French and English. For their share the allies took the two outer or northern locks with the three inter-jacent locks; while that apportioned to the English were the

three inner or southern docks. Between these structures was an immense quadrangular fitting-basin rising nearly 30 feet above the level of the Black Sea, supplied with water from the Tchernaya, pouring into the reservoir through aqueducts and tunnels. Thus provided, it fed the five docks; and the outlet for the waste run between the two French docks by a channel with a series of prodigious locks into the sea. Of this basin the French was charged with the destruction of the half contiguous to the northern docks, and the English that adjacent to the southern.

Of the nature of the duty which had devolved on the assailants some idea may be gleaned from a consideration of the dimensions of the docks. Stretching a line longitudinally from end to end the mean distance was 205 feet. The width was 92 feet; the depth 29 feet. The floors measured 190 feet long, compressed at the sides into a width of 40 feet. The revetments at the top were nearly 7 feet. The French docks were each 188 feet long and 92 feet broad. All the works were of the most solid kind. The hills out of which they were hollowed were of clay abounding with rock. They were thus in great part embedded in rock or hewn out of it at every point where the geological strata favoured the adaptation of natural expedients to a great end. Hard limestone was abundantly used in the work; so also was a material of a softer kind in unexposed situations. Granite of different colours in heavy blocks was used in all parts where resistance and impregnability were essential. In their massiveness and durability both docks and basin seemed likely to tire the patience of old Time himself. The steps—of the heaviest masonry—cut around the elliptical hollows, forming them, as it were, into amphitheatres, were “fit for a giant’s staircase.” But what seemed impenetrable to the wear and tear of ages and innocuous to those influences which insidiously eat away vitality from the mightiest fabrics was, in a few short months, torn up by mines and dashed into ruins as prodigious perhaps as those of Nineveh. Curved iron gates, unrivalled for size and strength, and covered with thick iron sheets overlapping each other and rivetted like the

plates of a leviathan boiler, closed the entrances to the several docks. They might have served to turn back the sea in some turbulent strait; and when it was required to move a single pair of them as memorials of Russian greatness and our own energy, it took no less than 140 artillerymen under a skilful engineer, Lieutenant-Colonel Bent, to lift them from their position, not in their entirety, but rib by rib and sheet by sheet.¹

To accomplish the overthrow of such stupendous works shafts and galleries were sunk and driven in various places to different depths and lengths. The shafts behind the revetments were at least 30 feet deep; those running along the floors not less than 12, whilst others sunk in salient spots varied between the extremes. The shafts were more than 70; the mines not less perhaps than 150. Culverts were also employed as galleries where their use promised to be of advantage. All the chambers held specific charges calculated with extreme nicety. In each case the result was a more than tantamount destruction with the least possible show. The English docks being four feet below those of the French were never free of water. There the land-springs, seeking the lowest levels, emptied themselves. To cope with a difficulty of such magnitude it needed more than the resource of the bucket and pulley; and yet these simple means were not less serviceable than more ambitious

¹ To remove the gates without injury, under fire from the north side of the harbour, was a tedious service. In each half gate, weighing about thirty tons, there were no less than 1720 rivets, every head of which had to be cut off and the pins punched out. Every screw had also to be removed by the usual means—a difficult process, arising from the oxidation of the several parts. The sheets were cut into twelve pieces for easy carriage. The iron girders, twelve in number, which like ribs sustained the structure, were drawn up by block and tackle; and then, lowered to rollers, were conveyed away. The greatest efforts were given in pulling up the heel-posts, of which there were two; and the strong unyielding haul of 150 men brought them without flaw from their rocky beds. One of the girders was broken in rolling it away, but its place was supplied by one from another gate. This was the only accident which had occurred during the operation. Sergeant John Docherty was Colonel Bent's foreman. An average of five sapper blacksmiths were daily employed at the work. Mr. Rumble, engineer of the 'London,' with two seamen, assisted until their removal to Malta. Some handy blacksmiths of the artillery also aided, and sergeant Welton of that regiment was remarkably active with the gear and tackling.

appliances. Pumps of various kinds were employed, but failing in the deep shafts to raise the water to the summit, their use was confined to the pits of the floors, where they seemed more successful. In the deep shafts the run of the bucket was incessant, for a suspension of labour, however short, was likely to be attended with an influx that would have overmatched any exertion. "The sappers," observed 'The Times,' "experienced great difficulty in firing the mines in consequence of the water running in on them from the clay, but with their usual energy they worked away and formed the mines."²

The works pressed on satisfactorily till the 16th December, when there occurred a storm which had been ushered in by two or three days' heavy rain. As may be expected, the shafts were inundated; those behind the revetments were filled nearly to the surface; some had twenty feet of water in them, while the bottoms of the docks were covered with the tempest rain to the height of two feet and more. Against such obstacles who could bear up? And yet none concerned in the works succumbed. To clear the water from the deep shafts with the means at command was impracticable. It was therefore permitted, in great part, to waste away; while the primitive service of the bucket and pulley aided somewhat to reduce the quantity. On the floors of the docks coffer-dams were constructed to detach the several shafts from the general flow, and pumps were worked by stout hearts to draw off the water; but the pressure for progress did not allow of this tedious process, and luckily the expedient was hit upon of cutting a channel through the revetment wall of the entrance into the feeder of each dock. The French miners made the desired opening, and the docks were almost drained. Still the shafts were full, and it was only by a sustained outlay of unrelaxed effort that the water was sufficiently reduced to enable the sappers to go below and fashion the galleries.

It was a great blow to the works was this storm. Everything was put back by it. Some of the shafts were given up as beyond all power to continue them, and many of the galleries,

² December 7, 1855

almost completed, had to be driven anew. Choked up with mud, the difficulties of working them were tenfold more trying than before. To master them the labour was as unsparing as incredible. Even in home works, away from the annoyance of an enemy, to overcome such obstacles would have been regarded as extraordinary. In such circumstances it needed artificial stimulants to maintain the strength and spirit of the men and offer an antidote against ills to which they were constantly exposed. An extra half-gill of rum was therefore issued daily to the sappers and linesmen, under the sanction of the Commander-in-Chief. But it did little to check the sickness which the miseries of the enterprise gave rise to. A nipping frost having succeeded the storm added greatly to their risks. Working in wet shafts in a close atmosphere, with vapour rising in streams from the depths, weakened the men by excessive perspiration. It is also recorded that many of them on reaching the surface from the galleries became frozen. Colds were so frequent and coughs so general that the barrack was like an hospital. Dredging-boats were scarcely any protection to the sappers and line miners, for the water poured in over the thigh tops and kept the limbs in perpetual slop. The few who were covered in miners' suits were hardly better off than their comrades. To them was assigned the most laborious portions of the work. Driving wet and muddy galleries was a relief compared with the operation of stowing away the powder in the chambers. Inclosed in three or four boxes or casks, the charge—sometimes weighing with its cases as much as 320 lbs.—was pushed on skids to the extremity of the narrow gallery. It required a series of plunges to move the burden to its place and give it a compact standing in a safe corner; and this frequently was done while the miners were up to their waists in water. Soaked to the skin, and coated with clay, it was a wonder that the workmen did not flinch from such hardships and break up under such trials. He indeed was a strong man who had worked his way through the entire demolition without a chest complaint or a pulmonary disease!

The blowing up of the docks was controlled by circumstances.

It was hoped to level at a crash the entire works by a simultaneous burst of the whole magazines. The intention, however, was shown to be abortive by the constant intrusion of water into the mines, which necessitated the less striking resort to a piecemeal demolition. The explosions were numerous, but three or four large ones were ventured which amply repaid by their success the risk of the experiments. Several failures took place, as was natural in an undertaking so great, from the unavoidable dampness of the powder and accidents to the agencies of ignition. The quantity of powder used was 49,384 lbs. or more than 22 tons! On the 6th of February the last explosion took place, and the memorable docks of Sebastopol were numbered with the structures of the past.

Who could look over the ruins without melancholy reflections on the insignificant origin of such a catastrophe? At an outlay of treasure that would have made an ordinary kingdom bankrupt those once superb docks were built. It took years to construct them, but a few months were more than enough to blot them out of the roll of Russian wonders! Uprooted from their foundations and tumbled over in the hollows, scarcely any two blocks maintained their former fellowship. Counterforts, copings, quoins, steps, and the general masonry were broken up and hurtled into strange heaps. Mingled with the tumuli were fractured beams and timbers, massive frames, and portions of the ponderous gates. Here and there were torn sheets of iron, splintered pintels, fragments of heavy posts, broken ribs, and bolts like crowbars, with clump heads as large as sledgehammers. Sticking up in the confusion were the angles of mammoth blocks of granite, some red, some blue, which by their garish aspect in the midst of so much devastation gave a play of vividness to the desolation. All that remained were a few dingy cantles of wall smoked by the explosions tottering upon the corners of some broken steps, waiting for a gust of wind to blow them down. As if to remind one of the incalculable loss to which the aggressive pride of Russia had given rise, there in all their vastness stood the scarps of the hills in which the overthrown docks had been reared. Fired and

caved they resembled frowning cliffs eaten away by a surging sea and the wear of centuries. Blackened craters and chasms intervened among the piles of fallen greatness and helped to augment the sternness and solitude of a demolition which was as complete as engineering skill could make it.

Beyond the ailments induced by wet, cold, and fatigue, the sappers quitted the docks, having suffered but triflingly from accidents. Private William Harvey was injured while at the bottom of a shaft by a man of the 18th regiment falling on him. A private of that regiment fell, on the 10th December, at night, into a pit upwards of thirteen feet deep and three parts full of water. His breast struck against an obstruction, which took away his consciousness. Corporal Cray, whose recklessness of self repeatedly gained him praise, descended the shaft to rescue the miner. The water was thick and discoloured with clay. Unable to feel the man, he was obliged to come up to recover breath. The second descent took him to the end of one gallery without success, and the third gave him the only hope of finding him in the other gallery. The struggles of the linesman had carried him in that direction, and Cray, almost exhausted, bore him to the top of the shaft, but life was extinct. Cray—poor fellow—ready in every danger, and foremost in many, was not, though he had escaped often and strangely, invulnerable against exposure, and the result of his gallant efforts was an attack which, reducing his voice to the feebleness of a whisper, sent him an invalid to England.

A fatal accident occurred to a private of the 48th regiment working at the bottom of a shaft close to the ruins of a culvert which had only a few hours before been blown up. It was near a dock-gate, and the gas from the explosion having penetrated the intervening earth diffused through the gallery, which had been driven in about twenty-eight feet. The 48th man was at its end and private Neville of the sappers at its mouth. Both becoming insensible, "with infinite alacrity and courage," wrote 'The Times,' "non-commissioned officers and soldiers descended the shaft, braving a danger which seemed the greater because its extent and nature were unknown, to succour their comrades, and

as they got down they in turn were overpowered by the offensive gas. Major Nicholson and Lieutenant Graham also went down and suffered in consequence." The former was insensible when, supported by his men, he reached the top of the shaft, and it was some time before he recovered.³ Besides the 48th man who perished six or eight other miners were seriously affected, particularly private Neville. The sappers who behaved so nobly were second-corporal Alexander Gray, who had charge of the shaft and was the first to descend; lance-corporal Marks, who got out Neville and Gray, and was himself thrown down by the poisoned air; and lance-corporal Normansell, who sent up corporal Marks and recovered the 48th man. Normansell had a rope round him, and feeling the gradual loss of power in his wrists and arms rushed to the end of the gallery, quickly tied the rope round the miner, dragged him to the mouth of the shaft, when, calling for help, both were borne to the surface. The corporal was unconscious, and remained so for some time, but the poor linesman was irretrievably gone.

While the operations were progressing the enemy fired at times with some briskness. Many shells pitched into the docks and exploded, but generally they fell short or wide of the shafts; "and though," says the official record, "the working party had some extraordinary escapes, only one sapper was wounded, and a private of the 18th regiment lost his arm." The sapper alluded to was second-corporal William Eastley, who was severely struck on the 19th January, 1856, in the right shoulder by the splinter of a shell. He was, however, returned as only slightly injured. This was the third time that the corporal was wounded during the siege.

Well may the corps refer to the destruction of these docks as a proof of their usefulness and of their capacity to undertake any skilled employments which war might suddenly throw in their way. Among the many operations of difficult and hazardous labour which have been achieved by their intelligence and industry, none, perhaps, will display in the chronicles of military engineering a more creditable page than this—the great con-

³ The 'Times,' February 11, 1856.

cluding event of the struggle with Russia. At every stage of the work their movements were known to those whose commendation it was an honour to merit; and when all was over their conduct and exertions were alluded to in terms of praise in a dispatch of the 2nd February from the Commander-in-Chief to the Minister for War.

"Amid great difficulties of cold and wet," wrote Sir William Codrington, "a very severe frost at one time and perpetually recurring pressure at another, the work went steadily on; and great praise is due to all those concerned—the engineers and sappers, parties of the royal artillery, the 18th regiment, and latterly the 48th. These parties return to their duties to-morrow after constant and laborious work."⁴

"The casualties have been but six, of which two only have been fatal; and one man of the 48th was lost by foul air in a shaft; after several vain attempts by Major Nicholson, other officers, and men—themselves descending at great risk—the poor fellow's body was brought up, but life was gone."

It only remains to close the mention of this signal service by appending the copy of a letter from the commanding royal engineer at Sebastopol, affording some details of the demolition and eulogizing the corps among others for its exertions:—

*Head-Quarters, Camp, Sebastopol,
February 1.*

"SIR,

"AFTER a period of three months' unceasing labour in the dock-yard, for the destruction of the docks, in compliance with Lord Panmure's orders, it affords me very great satisfaction to report, for your Excellency's information, the termination of our exertions in the demolition of that portion allotted to the English, which consisted of the three docks on the south side, and one-half of the east and west sides of the basin.

"The result of our operations has been the perfect destruction of the whole, the foundations being completely torn up. The length of time occupied in effecting the above object has, I regret, far exceeded what had been anticipated, owing to many circumstances over which no human being could have any control. Your Excellency, I believe, is aware that on the morning of the 16th December, 1855, after a very heavy and continuous fall of rain, all the shafts which had been sunk behind the revetment walls of the docks were found to have 20 feet of water in them, the shafts being 30 feet deep; and the shafts along the bottoms of the docks, which had been sunk to a depth

⁴ The sappers continued mining in the docks until the 6th February, and afterwards at the White Barracks, till they were blown down.

of 12 feet, were not only quite full of water, but had two feet six inches of water above the floors of the docks themselves.

"A very large party was employed day and night endeavouring to reduce the water, and effected this object but slowly, as the water continued to find its way in by percolation. At this stage of the work the wet weather was suddenly succeeded by intense frost, which for some days rendered our pumps useless, thus causing a further delay, and obliging us to bale the water out of the shafts, resuming the pumping as soon as the pumps would work again, which has been continued to the very last.

"It was the intention to have destroyed one entire dock at a time, but owing to the influx of water such an arrangement was obliged to be abandoned, and such charges only as could from time to time be prepared were fired, the pumping in many cases being kept up day and night until the last moment. The bottoms and sides were blown up before the sides were destroyed, which enabled us to be satisfied that the former were thoroughly demolished.

"I must observe that, as the demolition of the northern portion was carried out by the French, it is incumbent on me to explain why their operations were not subjected to as many difficulties as fell to our lot. Their docks were four feet higher in level than ours, and in no instance had they, I understand, any water to contend against, or, at least, so small a quantity as to be scarcely appreciable. Their charges in the bottoms were not more than six feet deep, whereas ours averaged ten feet six inches in depth.

"Though the external effect of some of our explosions may not appear great, I am happy to say that every portion of the masonry is either absolutely torn down or left in so dangerous a condition that it will very much add to the difficulties of rebuilding.

"I was extremely anxious that the facilities afforded by Her Majesty's Government for the employment of voltaic batteries on a large scale, as sent out by the Admiralty under Mr. Deane, should be fairly tested under the most favourable circumstances. I applied to Vice-Admiral Sir E. Lyons, who kindly offered the services of Mr. Deane, submarine engineer, to carry out the voltaic operations; and this gentleman had every assistance in skilled labour afforded him from the royal sappers and miners.

"Many failures having taken place in firing the charges of electricity, owing to different causes, I am inclined to doubt its advantages as applicable generally to military purposes.

"The pair of dock-gates ordered to be taken down and sent as trophies to England were removed with considerable difficulty, being very massive and strongly put together with bolts, nuts, &c., which had become rusty.

"I cannot say too much in praise of the exertions both of officers and men, including a party of 350 of the 18th and 48th regiments, in addition to the royal sappers and miners, amounting to 85,^a in the destruction of the docks, though they had to work, for the greater part of the time, day and night during the severest weather; and in having brought this service to a successful issue, after so many drawbacks, which, instead of causing despair and dispiriting those employed, only stimulated them to renewed exertions.

"I should be remiss in my duty were I to omit acknowledging the very valuable assistance I have received throughout from Colonel Gordon, C.B., the

^a This number would have been more correct had it been 185.

executive officer, Major Nicholson, who was the resident engineer, and Lieutenants Cumberland, Graham, and C. Gordon, royal engineers; their unremitting zeal, attention, and devotion to the work, in accomplishing this troublesome task under difficulties of no ordinary nature, claim my warmest thanks. I am also much indebted to Mr. Deane, submarine engineer, whose valuable services in preparing and firing most of the mines by voltaic action were kindly placed at my disposal by his Excellency Vice-Admiral Sir E. Lyons.

"I must not omit to acknowledge the professional aid received from the chief and assistant engineers of Her Majesty's ship 'Royal Albert,' (until that ship sailed for Malta,) in the taking to pieces of the dock-gates. In connexion with this service, the assistance afforded by a large party of the royal artillery, placed at my disposal by Lieutenant-General Sir Richard Dacres, and under the superintendence and direction of Lieutenant-Colonel Bent, royal engineers, I cannot but greatly appreciate.

"I have, &c.,

(Signed)

"E. T. LLOYD,

"His Excellency,

"Lieut.-Colonel Commanding Royal Engineer.

General Sir W. Codrington, K.C.B.,

Commander of the Forces.

As the last efforts were being made to overthrow the remnants of the docks, the engineers sent a force of 180 sappers with 100 men of the line under Major Ranken to destroy the White Barracks, built of stone, situated to the west of the Karabelnaia. In their magnitude they were nearly equal to the artillery barracks at Woolwich. The east and west ranges were almost a quarter of a mile in length, while the north and south ranges measured each 582 feet long. The area enclosed within the pile was a rectangle. The two latter ranges had three stories, the west two, the east one. Many other buildings for offices and domestic purposes occupied the interior of the rectangle, starting inwards from the eastern range, leaving a wide street adapted for parades towards the west. The clock tower stood over an arched entrance in the centre of a group of miscellaneous buildings. Heavy vaults were in the principal structures, in which were several sets of apparatus for warming the rooms. In most cases the walls were four feet thick. The west range rested upon two rows of strong pillars, and heavy masonry occurred in situations where taste and artistic development were desirable for strength and display. During the siege some of the walls and roofing had been pierced and torn by shot and shells. Much of the timber had been burnt, and a great quantity abstracted for war

emergencies; but injured and dismantled as were some of the buildings enough remained to excite the destructive action of an army bent upon humbling the military greatness in the Crimea of a stiff-necked and aggressive people.

No end of mines were made by the sappers in the piers of the windows, dead walls, vaults and cellars, and in pits underground. Innumerable were the charges varying in each chamber from 15 lbs. to 600 lbs. of gunpowder. The largest charges were placed in the vaults. Always tedious were the processes; the labour in many instances considerable, and the hardships experienced were those which arose out of intense cold, snow-storms, thaws and frost. The first charges were fired on the 30th January, the last on the 1st March, when the six largest vaults each loaded with 600 lbs. of powder were demolished. The great result of the operations was the complete destruction of the barracks. Here and there, however, were broken clumps of wall gravely standing as so many monuments of the general wreck, creaking upon shattered bases, all sufficiently dangerous to render the removal of every stone and plank from the site essential before attempting the re-establishment of such another pile.

The only drawback to this service—and a lamentable one it was—was the death of Major Ranken of the engineers on the 28th February. Sergeant Coppin went forward to ignite some mines which were ready for exploding. Four of them were in the angle of the south building, seven in adjacent windows and one outside. These he commenced to fire, passing on rapidly from one to the other, when to ignite the last he had to jump out of the window. In applying the light a rather large heap of powder in its vicinity caught the flame, which caused the hose prematurely to go off with luckily no other damage than burning his hand. Four of the mines missed. To repair the failure promptly was the major's determination, and so the charges were relaid in the gable to be fired from one focus, consisting of a three-foot length of fuse attached to the powder-hose. The major took with him second-corporal Baker, a man of tried intrepidity, who assisted in adjusting the fuses and hoses for

explosion, and then passed out of the window already much shaken by two explosions, through which the major intended to escape after firing the charges. In front of the opening the corporal stood to attract the attention of the major, so that should any mishap occur he might readily find his way out. The corporal saw the match applied, he saw the danger—the mines suddenly went off! In one fall down came the gable wall and angle of the building with the roof, and before the major could escape he was caught by the breaking mass and mangled under the ruins. Baker run at the instant, struck as he flew in several places, and was miraculously saved. Expecting that the major was following he looked back with a foreboding impulse to see how he fared; but his excitement and sorrow were great, when, seeing nothing behind him but the thick dust settling slowly over the ruins, it became his unhappy duty to bear the harrowing tale of the major's untimely death to those who were awaiting their return. With melancholy anxiety the sappers and others turned over the mound of rubbish to extricate the officer possibly with life. All night the duty was continued, and his remains were not discovered till eight o'clock the following morning. In this sad way was lost to the corps and the service as good and brave an officer as ever drew sword. His death was the last tragic event of the war!

1856.

CONCLUDING SERVICES IN THE CRIMEA.

Surveys, &c.—Casemates in the Redan and contiguous works—Roads—Injuries sustained by men in their execution—Huts and stables—Wharfs at Balaklava—Company to Cossack Bay—Peace—Bridge across the Tchernaya—Reinforcements to the East—Barrel-floats for the embarkation of the army—Graveyards and monuments—Parting Order by Lord Paulet to tenth company—Final services; Miss Nightingale—Order of leaving the Crimea and Turkey—Reviews at Aldershot; inspections by the Queen—Names of the distinguished men specially paraded before Her Majesty—Wreck of the Clarendon—Last detachment from the East—Statistics since the fall of Sebastopol—Surveys near Krzeroum—Parties detached for employment in the rectification of the Moldavian and Danubian boundaries—Company added to the Cape of Good Hope command—Corporal Mack present at the coronation of the Emperor of Russia at Moscow—A company to Portsmouth—Another to Aldershot—Removal of the museum from Marlborough House to Kensington Gore—A company moved to Devonport—Augmentation—A party embarks for Ceylon—Another for Mitylene—Corporal Pennington wins the "Champion's Belt" at the foot races on Chatham Lines—Corps incorporated with the royal engineers—Grade of private changed to that of sapper—History of the royal sappers and miners closed.

WHILE the services described in the previous chapters were in progress, others were in hand, which though not so striking, possessed importance either as necessities, precautions or improvements.

A few intelligent men assisted their officers in making observations and surveys of our trenches and the Russian works, and also of the country and coast in the vicinity of the conquered fortress, embracing an area of about twenty square miles.

Other non-commissioned officers and men assisted in taking an inventory of engineer stores which stocked the arsenal of Sebastopol.

The lines covering the fortress were remarkable for the bold expedients adopted by the enemy to shelter the troops required to defend the several works. Rude as they were they were speaking specimens of a nation's warlike genius. Caves had been hollowed out of the terreplein behind the traverses which ran parallel to the faces of the several formations, and were made bomb-proof by ships' masts and spars covered by a deep substratum of earth. The descent into them was by narrow flights of stone steps. Lighted by small loop-holed windows, a few inches above the level of the ground, and fitted up with guard-beds, tables, &c., these spacious subterranean chambers gave cover to a large force of defenders who were thus shielded from the chances of hurt even during the raging of a bombardment. As soon as the curiosity with which these structures had been viewed had passed, Captain Schaw of the engineers having under him a number of sappers and miners, set to work to destroy them. Holes were augured into the beams and ribs—hard almost as rock—and when loaded with gunpowder, were blown to pieces. The wood thus broken up was stacked by the line; and in the cold winter, when the means of obtaining fuel was precarious, the supply from the demolished Redan and contiguous ruins was found nearly equal to the demand.

For road-making a large force of sappers was daily detailed. Enormous working parties from the line were also employed. The great trunk communication from Balaklava to Cathcart's Hill was improved and partly formed from the port to the windmill by the Army Works Corps, and from the Forks on the plateau to the hill by the sappers and line. The stone for it was obtained by mining from two quarries, one on either side of the ravine. To make a solid foundation, the ground for the latter portion was picked up by the line, and when properly formed was covered by Macadamized stone. Its length from the Forks was about two miles, and its width thirty-five feet, including the side channels hollowed out by blasting for carrying off the surface water. It was a thorough serviceable road, and ages will roll over before this instance of British industry will be effaced from those physical characteristics by

which the allied occupation of that war-trodden country has been marked. From this great road radiated others, somewhat narrower, from the commissariat stores on the plateau to the several divisions. The ninth company at Kamara with the Highland division repaired the old Baidar road, and made a new piece, nearly half a mile long, running through the Sardinian encampment, which connected the Baidar and Woronzoff roads. Stretches of thoroughfare were also constructed through the cantonment. Each regiment at Kamara furnished working parties for the duties ; and all the roads, except that confined to the exertions of the Army Works Corps, were superintended by the sappers as overseers, the engineer officers being the directors.

The sappers injured in forming or mending the roads were privates Alexander Allan and Charles H. Cronk. Both were blown up, receiving severe wounds in the face. Private Samuel Williams at head-quarters had his back broken by a bank of earth falling on him, and died in consequence.

Hutting was another of their employments, and building stables or sheds for horses and mules. The companies with the divisions provided parties for these services. The form of the stabling varied according to circumstances and situation. Some of them—those of the first division for example—were as long as sixty yards by sixteen feet in the clear, with a passage up the centre marked by lines of poles supporting the roof. The sides and ends were made of the staves of barrels, which being bent and open assisted ventilation. Close boarding would have made the places insufferably hot. The roofs were of rough scantling ; the plauks overlapped and were spiked to rafters. Louvre boards run along the ridge the entire length of each gable. A little more attention and skill were paid to the internal fitments of the officers' stables ; and stalls, troughs and mangers were added.

For several months corporal Stacey superintended the erection of the wharf works at Balaklava, and was removed, when but little was required to be completed, on the 28th February 1856. The wharfage built round the harbour exceeded 500 yards and

was appropriated for the use of the several departments, each bearing its own name. There was the "Commissariat wharf," which had a run of nearly 300 yards; the "Ordnance wharf" had less ambitious dimensions; the "Quarter-Master-General wharf" occupied a length of shore for 150 yards, while the "Engineer wharf" and the "Cattle wharf" were amply provided with spaces. Strong piles from forty to fifty feet in height supported the flooring composed of timbers three inches thick. Vessels to receive their freight came broadside to the wharfs which had been built well into the sea for the purpose. These wooden quays were rapidly and substantially built, everything being put out of hand to serve the wear and tear of years, and was as creditable to the skill of the artificers as if they had been produced in times less trying and exciting. The whole range of wharfs was chiefly built by the 89th and 82nd regiments with casual assistance from other corps and a few sappers. On being relieved from the duty, corporal Stacey was commended for his "excellent conduct and steady perseverance" in constructing the wharf works "in a most satisfactory manner."

On the 26th the eighth company, under Captain Schaw, with Lieutenant Edwards attached, marched to Cossack Bay, and had traced out a line of entrenchments to be executed for covering the embarkation of the rear of the army in the event of such an operation being needed, when an event transpired which rendered the service unnecessary. The company remained nearly two months at the bay, during which it built a pier on the shore and run a road to it from the camp.

An armistice was concluded in the Crimea on the 29th, which temporarily suspended military operations till the 31st March; but as the plenipotentiaries at Paris had not then made known their agreement to a treaty, the armistice was prolonged indefinitely. The treaty, however, had already been ratified bearing date the 30th March, and on the 2nd April peace was proclaimed in the Crimean camps, ending a stubborn war which had taught Russia a grave lesson of the strength and firmness of the Anglo-French alliance, and proved that her shores and her fortresses—though vaunting an aspect of menacing impreg-

nability, were open to the endurance and valour of the quadruple league.

To break the boundaries which war had narrowed to prison limits and afford opportunities of intercourse between the belligerents was now a measure of first consideration. This was the chivalric wish of Sir William Codrington. To effect it the Tchernaya bridge was renewed. In thirty-two hours a party of sappers, directed by Lieutenant C. G. Gordon of the royal engineers, built a superstructure on the burnt tops of the old piles. The damaged portions, in part, were cut away, and cross beams being spiked to them, each pair of piles was clamped together by their heads. There were six pairs of piles at either side of the bridge, and along the series of clamps was stretched from end to end a stout beam on which rested a number of girders to support the roadway. This roadway was ten feet broad and twenty-six long from bank to bank and raised eighteen inches above the level of the stream. The Tchernaya was not a tidal river, but was swelled at times to an average depth of ten feet by mountain streams and the meltings of snow from the Tchatcr-Dagh range. The communication between the armies was open on the 6th April.

While a probability existed of the pending negotiations for peace terminating unfavourably, the War Minister, alive to this eventuality, did not stay his hand in keeping up the organizations of the Crimea to an efficient standard. Unmitigated vigour was displayed everywhere; troops were on the way to Balaklava, and a reinforcement of sappers, 299 strong, which had embarked at Liverpool on the 10th March, landed at Scutari on the 8th April. This force consisted of the 17th and 24th companies, with detachments to complete the old companies which had suffered during the war. Too late to be of service, they had not the good fortune to tread on Crimean soil. Up to this date the strength of the corps despatched to the East, including Lieutenant and Adjutant Saville, who joined from the royal artillery at the siege, reached a total of 1,644 of all ranks.

One of the stipulations of the treaty was the rapid evacuation of Russian territory; and the British troops, with inviolable

honour, were not slow in fulfilling this condition. The breaking up of camps and the pulling down of huts and stables followed with rapidity. The sappers and miners performed its share in this extraordinary clearance, and among an endless variety of services, made stalls for the officers' horses on board ships, and portable deck contrivances for the accommodation of the troops; but its most popular labours, at this time, were devoted to the construction and working of flying bridges for the embarkation of the army. No less than sixty rafts, made of beer barrels and rum casks, with the usual superstructure of baulks and chesses, were prepared for the operation. Each raft had fourteen barrels—seven to a pier; and the sixty rafts were lashed together into eight floats, varying in length according to circumstances, with pier-heads nearest the shore to bear the pressure of heavy baggage. The vessels were anchored with their sterns to the shore, so that each occupied a position between two bridges; and the troops, as they marched down the floats, only halted to run up the ladders, which had been reared for them, to the decks. Every movement of the floats was carried out so adroitly and with so much celerity that one regiment—second battalion of the rifle brigade—was embarked in less than twenty minutes!

Rubble walls were built round several of the British graveyards by some bricklayers and masons of the corps, while many stone-cutters were permitted to erect tombs and monuments to departed worth. Most of the memorials were built and inscribed by the sappers. Lance-corporal Simon Williams was one of the best artificers in this description of service. He erected the monument to the 44th regiment; the modest stone which covers the grave of Sir John Campbell; and the simple cross and reclined slab which mark the spot where repose the remains of Lieutenant-General Sir George Cathcart. The epitaph, which records in simple language the great events of his life, is written in English and Russian.¹ Corporal Keyte

¹ "I think," wrote Lady Georgina Cathcart, in returning thanks to the fourth division, at whose expense the memorial was erected, "the whole design handsome. The manner in which it has been executed, of solid and durable

built the monument to the corps of sappers, which bore the name of every man who had fallen or died during the war. He also worked several other tombs and grave-stones, among the best of which was the one erected in honour of Major Ranken of the engineers. Private David Thompson, an excellent mason, erected the monuments to the officers of the 23rd, 30th, and 33rd regiments. The masons of the tenth company, under the direction of Lieutenant Brine, executed the obelisks which stand at Balaklava and Inkermann. The one built in front of the Redan—of stones taken from the docks of Sebastopol—was reared chiefly by the companies quartered in the Karabelnaia and finished by the tenth. These three memorials rested on pedestals with copings, mouldings, and simple ornament, and were approached by three or four steps with broad treads. One panel of each displayed a cross, the other three short inscriptions in English and Russian. Private D. Thompson lettered those at Balaklava and Inkermann and assisted to inscribe the Redan monument. Private James Dickson of the third company executed two of its epitaphs and the cross.²

granite, in the midst of many difficulties and dangers, as well as privations, reflects great credit on all those engaged in it, and for which we feel most grateful."

² The Balaklava monument was enclosed within an iron handrail of twelve bars taken from the bridge on the locks across the docks of Sebastopol. Its epitaphs run thus:—"In memory of those who fell in the battle of Balaklava, 25th October, 1854." This was on one panel. On another was cut the words—"Erected by the British army, A. D. 1856." On the third, occurred both these records in Russian; and on the fourth was a sunken cross. Corporal Cameron was overseer of the work.

The Inkermann monument was thus inscribed:—"In memory of the English, French, and Russians who fell in the battle of Inkermann, 5th November, 1854." Sergeant McQuillin was the overseer and corporal Cameron the leading mason.

The Redan one bore this, as its principal epitaph:—"In memory of those who fell in the trenches and assaults upon the Redan, 1855." Corporal John Ross, of the second company, was the foreman.

The two latter monuments announced that they had been "Erected by the British army, A. D. 1856." On the third panel the inscriptions were repeated in Russian, and on the fourth was a cross—in relieve—bearing the Christian initials of I. H. S. for the Inkermann monument, and a sunken cross for that

Just prior to breaking up the light division, Major-General Lord William Panlett commended the tenth company in his orders of the 7th June—"My thanks," wrote his Lordship, "are also due to the officers, non-commissioned officers, and men of the tenth company royal sappers and miners, whose assistance has been most valuable to the division and their conduct most exemplary." Lieutenant Brine commanded the company.

The last services performed by the corps in the Crimea were building two tablets in memory of Lord Raglan in the wall of the room where his lordship died.⁵ This was done by private William Church. A monument was also built on Balaklava heights, overlooking the Sanatorium, which could be seen from the sea. It was a plain white marble colossal cross, without inscription, cut by Turkish and Armenian masons at Constantinople, and arrived after all appliances necessary to raise it had been stowed away in the ships about to sail for England. Its erection, nevertheless, proceeded, tackle being lent for the purpose from the 'Leander,' and was accomplished by some sappers hurriedly and with difficulty under Mr. Sargent, late of the corps. The cross was risen at the expense of Miss Nightingale, whose many graceful acts of deep sympathy and patient exertion for a suffering army have given her name historic celebrity. A strange influence she possessed which worked out remarkable results. Hundreds of mutilated soldiers, and hundreds more wasted by pestilence and disease, seemed to revive by her presence; and lived to bless her, or died unrepining, cheered through the vale, by the solace of her voice and the charm of her encouragement. How she brought order out

⁵ One was of marble, not worked in the Crimea, and the other of freestone. The first bore an epitaph in English; the latter in Russian. The Russian one was lettered by private D. Thompson. A large slab, seven feet by three feet three, was also laid to the memory of his Lordship, under a willow-tree, by a well in the hollow in front of head-quarters. It was placed there by Lieutenant Brine, at the request of Lieut.-Colonel the Hon. Leicester Curzon of the rifle brigade, and bore this simple epitaph:—"To the memory of Field Marshal Lord Raglan, G.C.B., Commander-in-Chief of the British army in the Crimea. Died 28th June, 1855." This inscription was cut by Thompson and private James Dickson.

of chaos ; how she overcame giant obstacles ; how she managed interminable offices, nursed the sick and wounded stretched before her in miles of ward and corridor, and in her tender devotion was herself twice thrown down by dangerous fevers, to renew, when only partially recovered, her hard but noble labours, are events which belong to the history of the world as well as the war. England has produced many self-denying and heroic philanthropists whose calm zeal to ameliorate human misery and suffering have won the lasting admiration of nations ; but the beautiful honour of being the chief of that excellent band belongs to Florence Nightingale.

The companies of royal sappers and miners embarked at Balaklava in the following order :—

1856.	Company.
23rd May	2nd—landed at Gibraltar 4th June, and there took up its station.
27th "	1st—landed at Malta 7th June, and there remained.
27th "	9th—landed at Corfu 3rd June, and there remained.
11th June	4th } landed at Portsmouth 9th July ; moved to Aldershot the
11th "	7th } same day, and marched into Chatham 19th July under
11th "	8th } Major Nicholson, R.E.
11th July	3rd } landed at Portsmouth—from the ' Dragon,' 5th August, and
11th "	10th } marched into Chatham the 9th, under the command of
11th "	11th } Major Robertson, R.E. The accommodation on board the
	war steamer was very limited, but Captain Houston
	Stewart, R.N., permitted the quarter-deck to be fitted
	up for them, which prevented that inconvenience and
	sickness to which a crowded vessel is usually subject.
	Exemplary was the behaviour of the men, "and Captain
	Stewart expressed to them the great satisfaction their
	good conduct and willingness in rendering assistance in
	carrying on duties on board had given him."
19th "	17th—embarked at Scutari ; landed at Malta 22nd July, 1856, and
	there remained.
17th "	A troop—embarked at Kulalce, landed at Woolwich 9th August,
	and removed next day to Aldershot to be stationed.
22nd "	24th—embarked at Scutari ; landed at Gibraltar 5th August, and
	there remained.

The three companies which marched to Aldershot under Major Nicholson were inspected with the division at the camp on the 15th July by Lieutenant-General Knollys. Next day all the troops that had served under fire in the Crimea were inspected by the Queen. The 17th was a day of review, when

all the sappers, including the 21st company, had again the honour of appearing before the Queen. The companies manœuvred with the troops as a battalion of infantry, and though they had not been regularly drilled for some years, their steadiness was very remarkable. In line their movements were not inferior to any troops on the field, and Her Majesty did not permit the occasion to pass without expressing her approbation of their appearance. Driving through the camp on the 18th, the Queen pulled up at the quarter occupied by the sappers and directed Major Nicholson to bring before her some of the men who had distinguished themselves during the war. The order, suddenly given, did not admit of making the best selection, and a number were instantly paraded. Major Nicholson explained their services, and "the Queen was graciously pleased to express herself in terms of great admiration of the devotion shown by this branch of the service;" and after speaking a few never-to-be-forgotten words to each man, Her Majesty ordered the Major to send a list of those whom she had seen to Osborne. The non-commissioned officers and privates who were thus honoured and whose names are among the royal documents are the following:—

Colour-sergeants . . .	{	John Coppin.
	{	Joseph Stanton.
	{	Kester Knight.
	{	William Harvey.
Sergeants	{	Andrew Greenwood.
	{	John Paul.
	{	Robert Purdy.
Corporals	{	William J. Lendrim.
	{	William Trimble.
Second-corporal . . .	{	William Baker.
	{	Neil McInnes.
	{	William Orr.
	{	William Harvey.
Privates	{	William Bruce.
	{	John Perie.
	{	Henry Bullen.
	{	Frederick Dimmer.

Most of the above had been decorated with medals or orders for bravery and unfailing zeal in the trenches. "Upon the

sappers undoubtedly devolved the hardest work of the siege," and Major Nicholson in his several personal interviews with the Queen was gratified to find that their services were fully appreciated. Desirous of retaining the recollection of their merits, Her Majesty ordered as an additional mark of her royal favour that four of the distinguished men should be photographed by Mr. Cundall of Bond Street. Those selected for this special distinction, and whose likenesses are among Her Majesty's Crimean portraits, were—

Colour-sergeants . .	{ Joseph Stanton.
	{ Kester Knight.
Sergeant	John Paul.
Private	William Bruce.

Eight sappers embarked in the 'Clarendon' on the 9th July at Balaklava. The troops on board were 150 and the horses 111. Lieutenant Graham, R. E., was in command. Buffeted and strained by a heavy gale the transport sprang a leak; but wearing on till the next day at noon—when the water had extinguished the fires—the troops, no longer able to remain with safety, were removed in boats without casualty to the French merchant ship 'Constance' off Cadiz. Several horses, however, had been killed during the storm, three of which belonged to officers of engineers. The 'Clarendon' after running ashore six miles to the westward of Cadiz was next day got off and towed by two steamers into the harbour with nine feet of water in the hold. In the 'Constance' the sappers remained about a week, from which they were transferred to H.M.S. 'Centaur,' and sailing for Portsmouth landed on the 12th August, arriving soon after at Chatham.

The last detachment from the East was one of 34 non-commissioned officers and men, which embarked at Scutari in the 'Resolute' on the 31st July, under the command of Lieutenant Malcolm of the engineers, and marched into head-quarters on the 17th August.

To complete the detail of Eastern statistics which have already been shown to the 9th September in a previous chapter, the following statement of casualties is added :—

	Number.
Died from injuries	1
Died from other causes . .	18
	<hr/> 19
Taken prisoner	1
Wounded severely	1
Injured by explosions . . .	2
	<hr/> 4
Invalided, of whom 6 died . .	82
	<hr/>
Total	105

The total casualties from the beginning of the war to the date when the last detachment quitted the Bosphorus was 550 out of a strength of 1,644 of all ranks; and if anything is calculated to excite remark and amazement it is the fact that out of so large a force only 252 had died!

Two months after Kars had fallen, second-corporal Edward Stephens and Thomas McEneney left England on the 28th January for Erzeroum to make special surveys of the city and its environs. At Marseilles they took passage on board the 'Sima,' and on arrival at Scutari waited till telegraphic instructions had been received, which directed them to proceed to Trebizond. Embarking on board the Lloyd's Austrian boat 'Egitto,' the vessel pushed into the Black Sea, and three days after, while passing Karasund, struck on a rock and remained fast. Amid the alarm and consternation which followed, the corporals sustained the British character for firmness and courage; and seeing that boats were approaching from the little watering village, quickly got their vast stores and luggage on deck and removed them to the shore. While doing so they had to stand with bared swords at the gangway to prevent the property in their charge being tumbled into the sea; for although there was no danger to be apprehended, the rush to the boats was such as might have been expected had the ship given signs of immediate sinking. At the command of the Pacha of Samsoon, who was on board, a Turkish war steamer on the third day arrived, and pulling the 'Egitto' from the rock, she sailed for Trebizond. Landing there, the corporals were provided by the consul with every requisite for their journey. Fifteen horses

was the measure of transport allowed for themselves and stores, and off they started for Erzeroum through a country strangely wild and picturesque. Theirs nevertheless was a long and dreary ride over mountains—one having an altitude of 9,000 feet above the sea—with the snow in places rising by drift into piles from two to twenty feet in height. Along precipices where the path was barely two feet broad they rode for an hour at a time, from which an inauspicious slip might have dashed them down the cliffs a thousand feet below. Skeletons of horses were bleaching by hundreds at the base of those terrific heights, which told a melancholy tale of accident and death. After a journey of thirteen days over tracks unimproved for centuries, they arrived at the seat of the pachalic on the 21st March 1856, and reported themselves to Colonel Geils, H. M. commissioner and chief engineer with the army of Anatolia. In a day or two the corporals had full employment. Stephens was sent ten miles away to reconnoitre an advanced position for a Turkish entrenched camp, and McEnceny was despatched to Alti for a similar purpose. While these warlike reconnaissances were in execution the news of peace reached Erzeroum on the 11th April, and the surveyors were recalled to carry out services in the city and vicinity. When the last accounts were received in England the corporals were about to be employed, one in laying out a line of road from Erzeroum to Persia, and the other to Trebizond. What specific services they accomplished in connection with this or other objects are unknown at headquarters. Enough, however, has been communicated to show that they have added, by the efficiency of their labours, to the reputation of the corps. Under date of the 3rd June, Colonel Geils wrote to Lord Panmure concerning them in these terms: “The party of surveyors have been at work from eight to twelve hours a-day since their arrival, with the exception of one Sunday. I have now had an opportunity of testing their abilities, and find them excellent draughtsmen and experienced surveyors. Their rank produces most disagreeable results when brought into contact with Turkish officers. These corporals are superior in military acquirements to most high officers in the

Turkish army. Their character has been severely tested and found to be unexceptionable, and I think Her Majesty's service would profit by their being commissioned officers. I consider the step advisable on the score of merit, even more than expediency." And as if to fritter away this anomaly to the greatest extent in his power, the colonel promoted them to be lance-sergeants.

Out of the treaty of peace arose the appointment of distinct commissions to carry on special surveys of the territory to be ceded by Russia both as a penalty for her aggressive predilections and to lessen the chances of future pretexts for interfering with neighbouring states. To assist these commissions Lieutenant-Colonel Stanton and two officers of royal engineers with seven sappers—corporal James Fisher being the chief subordinate—were sent to Bessarabia in May to survey the line of the new boundary between Russia and Moldavia; and Major Stokes, R.E., having under his orders five of the corps, including the two lance-sergeants from Erzeroum, was despatched soon after to survey and regulate the Danubian demarcations. These two men joined Major Stokes from Erzeroum early in September. As the surveyors will have to undergo great hardships in carrying on the work, much in water, along muddy shores and through the winter, usually severe in those regions, Lord Panmure has sanctioned the issue to them of rates of survey pay to the extent of four shillings a-day according to the amount of ability and energy each may display.

To supply the place of the company removed from the Cape of Good Hope during the war, the twenty-fifth company under Captain Akers embarked for that colony on the 25th July, increasing the sapper force there to two companies.

The singular honour of permitting a non-commissioned officer of sappers to be present at the coronation of the Emperor of Russia is an incident in its history of which the corps may be honestly proud. Corporal James Mack, whose services in connection with the Great Exhibition, the Department of Practical Science and Art, and the Paris Exposition have been so highly appreciated, was selected for this interesting tour. He left for Moscow at the end of July with the Embassy Extraordinary to

Russia, and returned to London at the conclusion of the fêtes and reviews in October, bringing with him a collection of photographs of the most striking scenes he had witnessed, and which he had himself photographed for national uses. A greater honour succeeded. A day was fixed for his attendance at Windsor Castle, when in person he was permitted to present to Her Majesty and Prince Albert a set of his photographic views, explaining, as the Queen and His Royal Highness passed from one to the other, the incidents and specialities of each.⁴ He has also had the gratification of exhibiting them to H.R.H. the Duke of Cambridge, Lord Panmure, Mr. F. Peel, and Sir Benjamin Hall.

A new station was opened for the corps at Portsmouth on the 5th August, on which date the eighth company, under the command of Major De Vere, was removed from Chatham for the duties of the engineer department. A few days after, a detachment of the company was sent to the Isle of Wight, taking up quarters in Cliff-end Fort.

The strength of the sappers at Aldershot was increased on the 9th by the arrival there of the 4th company under Major Nicholson.

On the 12th August twelve non-commissioned officers and men were sent to Kensington Palace to remove the Museum from Marlborough House to Brompton House at Kensington Gore, and to assist in its re-arrangement. The services of the sappers were so truly useful that an addition of eighteen men was made to the party two months subsequently.

Devonport, another new station for the corps, was occupied by the seventh company, which proceeded thither on the 26th August under Lieutenant Anderson.

As the army works corps had been disbanded, and the disasters in the Crimea, arising from an insufficient sapper force leading to sudden and expensive organizations, had shown the necessity of maintaining the corps in tolerable strength as a working body to meet unforeseen pressures in

⁴ By command of the Queen, Colonel Phipps presented the sum of five pounds to corporal Mack, "as a mark of Her Majesty's approval of the execution of the photographs."

war, its establishment was increased on the 1st October, from twenty-six to thirty-two companies, exclusive of the troop of drivers, each company being constituted as follows:—

	Colour Sergeant.	Ser- geants.	Cor- porals.	2nd Corp.	Bugl.	Privates.	Total.	General Total.				
28 general service companies, each	1	5	6	6	2	100	120 =	3360				
4 survey companies, each	1	7	8	8	2	94	120 =	480				
The band	0	1	1	1	0	30	33 =	33				
	Troop Serg- Major.	Troop Q. M. Serg.	Ser- geant.	Far- rier.	Corps.	2nd Corp.	Shoe- ing Smiths.	Collar Ma- kars.	Wheel- ers.	Trum- peters.	Drivers, Total.	
Driver troop }	1	1	4	1	6	6	4	2	2	2	100	129 = 129
Staff—Non-commissioned officers: 4 sergeant-majors; 4 quartermaster-sergeants; 1 bugle-major; 2 staff-sergeants, and 12 supernumerary-sergeants												23
Officers—1 assistant-adjutant-general, 2 adjutants to corps, 1 adjutant of drivers, 4 quartermasters, and 1 veterinary surgeon												9
Total												4034

Three non-commissioned officers with sergeant Winzer in charge, sailed for Ceylon on the 8th October in the 'Sumatra' from London. This little party of observers, surveyors and draftsmen, were asked for by Captain W. D. Gosset, the surveyor-general, who having for many years been the executive under the superintendent of the national surveys, knew the varied qualifications of the sappers and the value of military organization in conducting the duty "in a country chiefly wooded and excessively rough in many districts." While he sought to obtain subordinates with the amplest qualifications for colonial survey duty, Captain Gosset took care to secure, as an equivalent for their employment in a hot climate, an income which has far exceeded any remuneration ever offered to a soldier. According to their merits and exertions he has the power to reward each with a daily pay ranging from 5s. to 15s., exclusive of imperial pay and other colonial allowances.

Four non-commissioned officers under the command of Lieutenant R. M. Smith embarked at Portsmouth in the 'Gorgon' on the 13th October for Greece to be employed, as may be directed by Mr. Newton the vice-consul at Mitylene, in making excavations in the buried city of Teos, now Boudroun, to discover monuments, statues, and other antiqua for the British Museum. The party was selected with reference to the nature

of the work to be carried out. One was a draftsman and photographer ; the others respectively a carpenter, a stonemason, and a blacksmith, all able and handy men, adapted by strength, experience and intelligence to any service. Two of them had been travellers prior to their enlistment, and understood Greek. To associate these sappers with an interesting mission their names are given below :—

Second-corporal William Jenkins.
Lance-corporal Benjamin L. Spackman.
" Patrick Nelles.
" Francis Nelles.

All but Spackman had been in the Crimea and received medals and clasps. Jenkins, a ponderous man with a shaggy beard, the true type of an Englishman, was well known throughout the army for his services at the siege ; and his gallantry on more than one occasion, was acknowledged by the gift of a medal "for distinguished service in the field."

On the 17th October—the second anniversary of opening the siege—the designation of the Royal Sappers and Miners was altered by Royal authority, probably as a compliment to the corps for its approved services before Sebastopol. The announcement was made in the 'London Gazette' as follows :—

"The Queen has been graciously pleased to direct, that the corps of royal sappers and miners shall henceforward be denominated the corps of royal engineers, and form one body with the existing corps of royal engineers."⁵

⁵ On that day foot races and games were carried on at Chatham, which drew thousands of holiday people to the lines to witness them. The races were so arranged that each of the principal services in garrison should win a prize. These were the royal sappers and miners, provisional battalion, royal marines, and medical staff corps. Each corps in turn ran its own approved races, and the best man among them received a reward. The successful competitors afterwards drew up on the course in aerial costume—the representatives of their regiments—whose athletic reputation seemed to depend on their energies and success. With significant but pardonable conceit and confidence they took their stations, all certain of winning. They started—their pace was beautiful. Well together, it was difficult to say who would first reach the goal, but corporal Pennington of the sappers, rushing ahead with the swiftness of the wind, flew past the winning post cleverly by several yards and bore away the "Champion's belt," thus inaugurating by his conquest the altered designation of the royal sappers and miners.

Thus is removed that standing misnomer by which the sappers and their officers, virtually one body, were by some incomprehensible caprice in the now obsolete military economy of the ordnance, called by a plurality of titles. Separated by name from their officers, and thrown seemingly into a cold unfriendly shade, the want of a family patronymic—one title of identity in common—was keenly felt by the sappers. Sir Charles Pasley was the first to moot the question. His representations ran through a period of forty years. Many other officers, considering that no sacrifice of exclusiveness should stand in the way of improving the *status* of the corps, adopted his views; and with the generous assistance of Sir John Burgoyne and the ready acquiescence of Lord Panmure the change was effected—breaking up an anomaly which it is proudly hoped will interlink and cohere both officers and men.

Accompanying this change was the abandonment of the rank of private—an unmeaning name for a well-defined grade, and substituting for it the more expressive and appropriate designation of sapper.

The history of the Royal Sappers and Miners is now closed. Henceforward its services belong to the history of the Royal Engineers.

1856.

Concluding Chapter.

Establishment of the corps—Organization of companies—Distribution—Establishment at Chatham—The Ordnance Survey—Its divisional districts—and military character—Qualifications of the observers—List of the non-commissioned officers employed as such—Greatest distances observed by them—Importance of the services of the non-commissioned officers, as proved by the reduction of the officers—Situations of trust filled by them—Strength of the companies—Average distribution in the United Kingdom—Division of labour—Great triangulation—Private James Weir—Secondary and minor triangulations—Other general survey duties—Pereambulation of boundaries—Sergeant Robert Meade—Pay and allowances—Skilful and distinguished talents and usefulness of eleven non-commissioned officers; and of quartermaster William Young—Merits and services of the survey companies.

THE establishment of the corps, excluding the nine staff officers attached to it, counts a total of 4,025 of all ranks. This number is divided into thirty-two companies, twenty-eight of which were raised for general service, and four for the duties of the national surveys. There is also one troop of drivers.

Each general service company is organized, with respect to trades, in numbers equivalent to the assumed wants of the service; and thus constituted, it is in a position, in proportion to its numerical efficiency, to undertake and accomplish any work within the scope of military purpose and requirement. The skill of the workmen and their ability as a body are rendered certain, by the enlistment of none but good or promising artificers, and the extreme care taken to form a company for duty.

Such, however, is not the rule in completing a survey company, for men of superior intelligence and acquirements only are drafted to them, irrespective of any classified organization of their establishment with respect to trades.

The distribution of the corps is as follows :—

	Companies
Chatham	6
Woolwich	1
Aldershot	2
Portsmouth	1
Devonport	1
Gibraltar	2
Malta	2
Corfu	1
Halifax, N. S.	1
Mauritius	1
Cape of Good Hope.	2
Western Australia	1
New Zealand	1

Detachments from the above are at the following places :—

London—Department of Practical Science and Art.

Shoeburyness.

Alderney.

Isle of Wight.

Greece—Bondroun.

Danube.

Bessarabia—Boigrad.

Turkey—Scutari—(one corporal only closing up, under Major E. C. A. Gordon, the transfer of the buildings in charge of the expedition).

Ceylon.

Bermuda.

South Australia—Port Adelaide.

Victoria—Melbourne.

Sydney, New South Wales.

	Companies.
Service companies	22
Companies not formed.	6
Survey companies	4
	—
	32
Aldershot—Driver troop	1
	—
Total	33
	—

For Sandhurst a detachment is furnished for two periods in each year for the practical instruction of the cadets in field engineering, pontooning, and bridgemaking. A similar party is also provided for the instruction of the gentlemen cadets at Woolwich ; but its services are simply confined to the construc-

tion of a few field-works, and the making of fascines and gabions.

It will be unnecessary to allude to the present employment of the sappers further than to notice, that at all engineering stations at which they are quartered, they are appointed to share in the execution of ordnance works.

At Chatham the sappers receive instruction in the field services of the royal engineer department. The course followed is very complete, omitting no detail with which a sapper should be acquainted, and embraces the teaching of a system of pontooning with every variety of means and appliance, also bridge-making, photography, telegraphy, and the recently-introduced system of rifle science and judging distances. Now that permanent teachers are appointed to the establishment to afford tuition in the elementary principles of fortification, and in plan-drawing and surveying, there is every reason for anticipating that the corps will much improve in the theoretical as well as practical knowledge of its peculiar duties, and be better fitted—when thrown by accident away from their officers into circumstances of difficulty and danger—to apply the resources of their acquirements and experience to master the one and conquer the other.

The four survey companies are engaged in completing the secondary and minor triangulation of Great Britain; the detail survey and contouring of Scotland and the four northern counties of England, and the revision and contouring of the northern counties of Ireland. Occasionally they carry on special surveys for the Government; execute similar work for sanitary purposes for local boards of health, and make surveys of particular towns, parishes, and manorial estates—for municipal service or proprietary record and reference—at the expense of local corporations or of private noblemen and gentlemen. Small parties have at times been employed in making tidal observations for investigating the theory of the tides and for other scientific uses, and also in gleanings much subsidiary information, to be embodied in the Ordnance Memoir of the Survey, should it at a future day be published. In

Ireland, the companies did excellent service in collecting various statistical details, and gathering minerals, fossils, and objects of natural history, to assist in developing the investigations of those interesting subjects. In conducting the survey of Great Britain, however, that branch of the duty has been abandoned.

The survey department comprises nine divisions, the headquarters of which are at Newcastle-on-Tyne, Darlington, Carlisle, Glasgow, Edinburgh, Kelso, Ayr, Dumfries, and the Harris isles, a group in the Hebrides. Southampton is the chief station. Special divisions also include detachments employed in the triangulation, perambulation of boundaries, in the duty of levelling and contouring, and hill-sketching, while a strong force is employed in Ireland, with its principal offices at Dublin, Belfast, and Enniskillen. No idea, however, can be formed from this detail of the actual distribution of the survey companies, for the men are dispersed, singly or in small numbers, throughout the United Kingdom. The duty of levelling alone at one time engaged no less than thirty-six detached parties.

The survey is organized and conducted on military principles, "and though the assistance of civilians is largely made available, it is simply to serve as the muscles for the military skeleton. No branch of the duty," except the engraving, "is performed exclusively by civilians." The officers of royal engineers have the chief direction. "Their number, however, is by no means constant, but is regulated by the extent of ground under survey, and by the degree of proficiency of the non-commissioned officers."¹

Until 1843 one or more officers always remained with each great instrument, "but now the non-commissioned officers are so well instructed, that they can observe as correctly as their superiors, and the constant presence of an officer is no longer necessary."²

The non-commissioned officers who have, as observers, had charge of the different great instruments are as follows:—

¹ 'Aide Memoire,' iii., p. 612.

² *Ibid.*, p. 613.

Ordnance 3-feet Theodolite by Ramsden.

Sergeant James Donelan from December, 1841, to April, 1842, and again from January, 1843, to September, 1849. He also held the charge for some months in 1849 and 1850 of the Royal Society's instrument, which he set up at near stations to his own.

Corporal William Jenkins, from September, 1849, to October, 1852, when it was returned into store at Southampton.

Royal Society's 3-feet Theodolite by Ramsden.

Corporal James Mulligan, January to March, 1843, when he quitted for the boundary survey of America.

Second-corporal Thomas Cosgrove, November, 1843, from Lieutenant Luyken, R.E.

Second-corporal James Stewart, August, 1844.

Corporal James Steel, June, 1845.

Corporal Robert Forsyth, August, 1845.

Corporal John Winzer, January, 1846.

Sergeant James Donelan, March, 1849.

Corporal Walter Grose, November, 1850.

Colour-sergeant James Donelan and corporal Walter Grose, August to December, 1852, at Goat Fell, relieving each other constantly.

Corporal Walter Grose, December, 1852, to March, 1855, when the use of the theodolite was discontinued.

This is the instrument that was used by General Roy, and subsequently by Captain Kater, in making the trigonometrical observations for determining the difference of longitude between the observatories at Greenwich and Paris.

The greatest distance ever observed by sergeant Donelan was to an object 106 miles from his station. His next two greatest were to points between 104 and 105 miles off. Corporal Jenkins even gained upon his instructor, and observed distances of 106 and $107\frac{1}{2}$ miles. Corporals Forsyth and Stewart were more successful still. One distance obtained was 106 miles, another 108 exactly, and both observed an object upwards of 111 miles away. This achievement records a measurement which exceeds in distance any observation heretofore made on the Ordnance Survey.

The 2-feet Theodolite was used by—

Corporal Andrew Bay, from March, 1843, to May, 1847.

Sergeant James Beaton, from May, 1850, to March, 1855.

Mr. late sergeant James Donelan, from April to September, 1855.

Sergeant James Finch, March, 1856, and still retains it.

The 18-inch Theodolite has been employed by—

Corporal James Steel, from August, 1841. Corporal James Beaton had charge of it for about three months when corporal Steel was at Southampton, in the summer of 1844.

Corporal John Winzer, June, 1845.

Sergeant James Steel, February, 1848, for the London survey.

Corporal William Jenkins and second-corporal John Wotherspoon assisted sergeant Steel in the London triangulation.

Second-corporal John Wotherspoon, November, 1848.

Mr. James Donelan, January, 1853, to May, 1855.

Private William McConomy, June, 1856, and still retains it.

At one period there were forty-five officers on the survey; at another nine only; now there are nineteen including the superintendent. Although the number of officers is very small, considering the extent of the total force employed, yet, by a simple arrangement, the numerous detachments are effectually commanded by the officers. The strength of the different parties is not proportioned to the ranks of the officers, but to the exigencies of the service on which they are employed.³

Except at Southampton and Dublin nearly all the offices of importance and trust on the survey are filled by sappers, “no civilian,” except in a few instances, “being responsible for more than his individual labour.” Each section in the field, however small, “is under the charge of either a non-commissioned officer or private, who is responsible that the work is carried on according to orders, and that every precaution to prevent negligence or deception is taken. In the office likewise, a non-commissioned officer superintends each department of the work and reports either directly, or through a senior non-commissioned officer, to the officer of engineers in charge. Every division having commonly several small detachments in the field, the payment of each detachment is necessarily made through the non-commissioned officer in charge of it.”⁴

The actual strength of the corps on the survey on the 14th June, 1849, taken from a return presented to the Committee of the House of Commons on Army and Ordnance Expenditure,⁵ is subjoined:—

³ ‘Aide Memoire,’ iii., p. 613.

⁴ Ibid., iii., p. 613.

⁵ Appendix II. p. 1055

ENGLAND.

	Sergants.	Bugl.	Rank and File.
Head-quarter office—general work and computing	0	2	38
Principal triangulation	2	0	28
Inserting improvements, &c., in the 1-inch map	0	0	1
Secondary and minor triangulation	0	0	1
Levelling and contouring	1	0	9
Six-inch survey and plan drawing of Yorkshire and Lancashire	8	1	110
Survey of London for sanitary purposes	5	0	20
Survey of Devonport for military purposes	1	0	11
Total	17	3	218

Head-quarter Stations.—Southampton, Wakefield, York, and Doncaster.

SCOTLAND.

Secondary and minor triangulation	0	0	6
Six-inch survey and plan drawing of Kirkcudbright, Dumfries-shire, and the Isle of Lewis	3	0	63
Total	3	0	69

Head-quarter Stations.—Dumfries, Stornoway.

IRELAND.

Plan drawing, printing, workshops	1	1	5
Contouring Donegal	0	0	3
Revising Donegal and Londonderry	3	0	15
Total	4	1	23

General Total 24 4 310^a

Head-quarter Stations.—Dublin and Londonderry.

The survey strength and distribution on the 17th October, 1856, the date of changing the designation of the corps, were as follows:—

ENGLAND.

	Quarter-master.	Staff-sergeants.	Sergants.	Bugl.	Rank and File.
Head-quarter Office, { Drawing, computing, tracing,	1	2	2	4	32
Southampton. { printing, &c.					
Ditto. { Detached, levelling, and contouring	0	0	0	0	4
Ditto. { Ditto, secondary and minor triangulation	0	0	2	0	14
Carlisle { Detail surveying and drawing plans	0	0	2	0	22
Levelling and contouring	0	0	2	0	13
Newcastle { Detail surveying and drawing plans	0	0	3	0	27
Darlington { Ditto ditto ditto	0	0	3	1	28
Total	1	2	12	5	140

^a The above detail is the last official statement published.

SCOTLAND.				Quarter-	Staff			Rank and
				master.	sergeants.	Sergeants	Bugl.	File.
Edinburgh	{	Leveling and contouring . . .		0	0	2	0	13
		Detail surveying and drawing plans		0	0	1	0	33
Glasgow		Ditto ditto ditto		0	0	2	0	28
Dumfries		Ditto ditto ditto		0	0	1	0	31
Ayr		Ditto ditto ditto		0	0	2	0	36
Kelso		Ditto ditto ditto		0	0	1	0	32
Harris Isles		Ditto ditto ditto		0	0	0	0	4
Total				0	0	9	0	177

IRELAND.								
Dublin	{	Drawing, tracing, printing, and } contouring		0	0	2	1	20
Enniskillen		Revision survey		0	0	3	0	36
Belfast		Ditto and contouring		0	0	3	0	41
Total				0	0	8	1	91
General Total—Great Britain and Ireland .				1	2	29	6	408

There was also a civil force, working with the survey companies, of upwards of 1,700 persons, more than 600 of whom were labourers. The remainder, for the most part, were engravers, surveyors, draughtsmen, computers, and clerks.

For the last thirteen years the strength of the corps on the duty has been disposed of as follows: The totals calculated from the monthly records are the annual averages. Of this force a strong detachment has always been employed in the work of the triangulation, at one time amounting to fifty-four men, who alike visited the mountains of Scotland and England. Such also was the case with the contouring detachment, which in the early part of 1853 and down to October, 1856, numbered about forty men of all ranks. Both parties are included in the averages for England, as their location, from being constantly on the move, has not been determined in the general monthly returns of the corps:—

	England.	Scotland.	Ireland.	North America.		Paris.	Erzeroum & Danube.	Total.
				Bound Surv.	Explor. Surv.			
1844	199	6	26	20	0	0	0	251
1845	209	14	25	10	0	0	0	258
1846	198	28	23	7	13	0	0	269
1847	206	30	29	0	11	0	0	276
1848	216	43	28	0	10	0	0	297
1849	233	71	28	0	0	0	0	332
1850	202	79	28	0	0	0	0	309
1851	203	61	28	0	0	0	0	292

	England.	Scotland.	Ireland.	North America.		Paria.	Erzeroum & Danube.	Total.
				Bound. Surv.	Explor. Surv.			
1852	190	57	26	0	0	0	0	273
1853	169	84	35	0	0	0	0	288
1854	182	89	75	0	0	0	0	346
1855	180	123	85	0	0	3	0	391
1856	173	147	88	0	0	0	2	410

The greatest strength of the sappers employed on the survey duty, was, in October, 1856, 446 of all ranks.

The division of labour is perfect in detail, and as comprehensive as its delicate minutæ will permit. To each department of duty a proportion of sappers is attached with reference to their acquirements and experience, and the wants of the service. In the principal triangulation recently finished, the sappers always took an important part. Young soldiers newly posted to the companies, who displayed no particular aptitude for finer work, were usually sent upon it. The duty was arduous and severe, and the men invariably slept in tents or portable huts, on mountain slopes at high altitudes. A sketch of a survey hill encampment may be seen in the Aide Memoire, which graphically illustrates the rugged character of the site, and by inference, the difficult and trying nature of the duty.⁷

In the great triangulation, the 3-feet, 2-feet, and 18-inch theodolites are used to make the required observations. At the several stations selected for the work, each instrument is fixed in a "crow's nest" on some mountain peak or crag, or perched upon the turret or narrow towering steeple of some country church or city cathedral, or stayed by guy-ropes among the battlements of some deserted old castle.⁸ For the last

⁷ Vol. iii., p. 614.

⁸ Private James Weir was perhaps the most daring sapper in building stages for the observatories. Like the chamois he could climb heights almost inaccessible, and stand or sit at work on ledges, copings, pinnacles, vanes, and pieces of timber, where scarcely any human being would dare to venture without all the accessories and appliances which precaution could command for insuring safety and preventing alarm. At Ely minster, the tower of which is about 200 feet high, and at Norwich cathedral, the spire of which is the most elevated in England, being 327 feet from the ground, he was as agile and self-possessed as in an ordinary workshop. At Norwich spire, a brace broke under him, and he fell a distance of nine feet, but in his descent he caught hold of another brace, and thus saved his life. The accident did not injure him.

thirteen years, non-commissioned officers with strong camp parties under them have fulfilled this duty, and have visited, in every vicissitude of weather, nearly all the leading trigonometrical stations in Great Britain. "It is, perhaps, right," says Captain Yolland, "to mention, that whereas formerly, it was deemed necessary to employ general officers of the army and scientific individuals to make the required observations with the theodolite to carry forward the principal triangulation, the whole is now done by non-commissioned officers of sappers, the

him, for the next moment he was at work again, as cool and as brisk as ever. At Keysoe, in Bedfordshire, the builder who contracted to take down a portion of the spire was about to relinquish his engagement as hopeless, but our adventurous scaffold-builder was lent for the occasion, and the removal was soon accomplished. Weir took up his ladders and fixed them, but before placing the last one, he climbed the spire, unaided by scaffolding or supports, and, 'o crown his success, took off the vane, and brought it down with him. He achieved a still bolder feat at Swaffham in Norfolk. Upon a projecting joist which he had fixed, the dimensions of which were four inches wide by twelve feet long, he walked steadily forward to its end, at a height of about 120 feet, and with astounding coolness and dexterity performed his hazardous duty. At Thaxted, in Essex, he climbed the outside of the spire by the crockets, and at the giddy altitude of about 210 feet from the ground, sat upon the creaking vane, and whirled himself round upon its grating pivot. This was on the 11th April, 1844. A drawing of the scaffold and stage was given in the 'Illustrated London News' of that date. At Danbury, in July, 1844, his services were very distinguished. To take the initiative or first step in any one of these perilous services was always the most important task; but however difficult or dangerous it promised to be, Weir never shrank from its performance. Climbing the inside of the steeple, he reached its topmost sounding aperture, in which he secured a piece of timber. This projected some feet beyond the spire. Upon the end of this joist he stood, and after hauling up a ladder, fixed it upon the projecting timber, and then ascended by the shaking ladder to the top of the spire. There he hauled up the block and tackle, made it fast to the steeple, and descended amid the cheers and wonder of the crowd who witnessed his fearful exploits. The services of this daring man were frequently alluded to with especial particularity by the provincial press, and alike insured the applause of his comrades and the approbation of his officers. He afterwards served on the exploration survey for a railway in North America. In May, 1848, he purchased his discharge, and set himself up in business in Halifax, Nova Scotia. His industry and mechanical ingenuity soon brought him success in his new line of life, and he received the appointment of superintendent to the Water Company in that town, which he fulfilled, at a salary with other emoluments, of about 200*l.* a-year. On receiving this appointment the company purchased his stock of goods from him for about 700*l.*, and he bids fair, in a few years, to be a wealthy man.

only difference being, that in the one case the general officer worked out his own results, and in the other the non-commissioned officer simply forwards his observations to Southampton for computation. That" continues the captain, "is a very important economical result of employing sappers and miners."⁹ "In justice to the highly meritorious body of non-commissioned officers of the corps of royal sappers and miners," writes Colonel James, "I should state, that whilst in the early part of the survey the most important and delicate observations were entrusted solely to the commissioned officers, these duties have of late years been performed by the non-commissioned officers with the greatest skill and accuracy."¹⁰

Several parties are also employed in conducting the secondary and minor triangulations. In prosecuting the former, theodolites of 12 and 10 inches diameter are used, in the latter 9 and 7 inches. The use of the smaller instruments was commenced about 1826 by the sappers, who carried on the observations in connection with the chain survey. Next year a few sergeants were entrusted with 12-inch instruments. In 1833 some expert men were attached to the mountain party of Captain Portlock, who thoroughly trained them as observers. About 1838 a selection of some forward and enterprising sappers was sent to Lieutenant Downes, to replace the civilians in charge of the observing parties. From this time is dated the general employment of sappers in the use of the secondary class of instruments. "The system of employing trained sappers" in the work of the triangulation, and in the use of the zenith sector was "introduced by General Colby, and attained during his time its fullest development."¹¹ Here it should be noted, however, that the sappers in the field are confined to the practical duty of observing only, and consequently take no part in the responsibility of the calculations, which are entirely carried out under the direction of the officers of royal engineers. As mere ob-

⁹ 'Army and Ordnance Exp.,' 1849, p. 503.

¹⁰ Colonel James, 'On the figure, dimensions, and mean specific gravity of the Earth,' read before the Royal Society, May 8, 1856.

¹¹ 'Professional Papers, R.E.,' N.S., iii., p. xxiii.

servers the non-commissioned officers have succeeded eminently, and their observations will bear the strictest comparison with any previously made either with the great instruments or the zenith sector.

The other duties of the companies comprise the computation of distances, areas, altitudes, latitudes and longitudes, the detail survey of the kingdom, and the drawing and colouring of the necessary plans for engraving and publication. Several men have the important duty to discharge of examining the work on the ground, before the plans are fairly finished ; and a number are constantly employed in contour levelling. The great bulk, however, of the companies is dispersed on the detail survey and in plan-drawing.

A few non-commissioned officers are also engaged in the perambulation and notation of public boundaries—a branch of duty demanding from those selected to carry it out a good understanding, a habit of sifting and weighing evidence of a confused and contradictory character, and mental vigour sufficient to bear up against the hard and depressing study of wearying and uninteresting details and registries. Long-standing litigations between parishes and townships respecting the demarcation of certain lands have often been investigated by the non-commissioned officers, and upon the accuracy of the reports drawn up by them depended the decisions of the superintending officer. In elucidating the features of particular territorial disputes, dry legal enactments and charters, corporate and manorial records and histories, have not unfrequently to be consulted. Some important cases, shrouded in difficulty and complexity, have called for a more lengthened inquiry and application ; and the plodding perambulators, to make themselves masters of the points at issue, have even extended their researches to the study of old and abstruse authorities, such as Pope Nicholas' *Taxation*, the *Valor Ecclesiasticus* of Henry VIII., and the MSS. of Torre and Archbishop Sharpe. Some of the reports display a more than average amount of talent, argumentative skill, and antiquarian information.¹²

¹² Sergeant Robert Meade is perhaps the most distinguished in this depart-

The following detail shows the regimental and survey rate of pay received by the sappers on the 14th June, 1849, at the time the committee was sitting on army and ordnance expenditure :—¹³

	Regimental Pay.		Survey Pay.		
	s.	d.	s.	d.	s. d.
1 sergeant-major	4	7½	4	0	
3 colour-sergeants	3	3½	2	9	to 4 0
20 sergeants	2	9½	2	1	„ 3 0
25 corporals	2	3½	1	4	„ 2 10
26 second corporals	1	11½	1	4	„ 2 6
2 privates	1	3½	2	0	„ 2 6
170 privates	1	3½	1	0	„ 2 0
91 privates	1	3½			under 1 0

338 Total.

The majority of the lowest class were men who had but recently joined the survey, and whose attainments and usefulness had not been sufficiently known to warrant their being advanced to the higher classes. The working pay is fixed by the superintendent at a rate for each “according to his acquirements and industry ; and for the satisfactory performance of duties requiring management and ingenuity, such, for instance, as reflecting with the heliostat, piling hills with judgment,” accuracy and expertness in taking astronomical observations, &c., “it is customary to allow special rewards.”¹⁴

ment of duty ; for, combining the powers of a ready intellect and keen perception with unsparing assiduity and patience, he has succeeded in unravelling some extraordinary cases. Skelton in Cleveland, Yorkshire, in which had existed a dispute from time immemorial affecting the legal appropriation of nearly 2,000 acres of moor and enclosed lands, was decided, on his exposition, by the officer intrusted with the responsibility ; and the boundary between the townships of Rylhill and Camerton, in the same county, was altogether unknown to the authorities of the respective townships till he obtained access to some old documents, which enabled him to mark out the ancient line of boundary. Indeed, it may here be added, that scarcely a single township is perambulated without the non-commissioned officer finding it necessary to rectify some error in the rating of lands and premises, or to draw up a report, detailing the circumstances of some feud between neighbouring parishes, respecting boundaries or parochial apportionments.

¹³ ‘Army and Ordnance Exp.,’ 1849, App. H, p. 1056. This is the last official statement published. It was wished to afford a similar statement, to the latest cardinal date in these records, but the information could not be procured.

¹⁴ ‘Aide Memoire, R.E.,’ iii., p. 613.

A few of the non-commissioned officers and men not already mentioned in these records, who have been conspicuous on the duty, and have gained special attention for their abilities and advantageous services in very responsible situations, are here given as examples, to encourage others in the corps to seek and cultivate still higher attainments, and to emulate their usefulness and zeal.

Second-corporal William Lowrie. Enlisted in July, 1833. Application and industry soon made his services of value to the survey. His maps of the city of Limerick and town of Liverpool have ranked him among the first class of draughtsmen. In January, 1845, he purchased his discharge, and obtained profitable employment in the Assessionable Manors' Commission. He is now surveyor and draughtsman at a high salary to the harbour department of the Admiralty.

Sergeant James Sinnett. A non-commissioned officer of indefatigable energy and intelligence; was one of the best draughtsmen in the corps, and excelled in landscape drawing; was also an efficient superintendent, and after a service of more than eighteen years, died at Liverpool in August, 1844.

Sergeant William Jenkins. Has been principally employed in the triangulation, and has observed with the 3-feet theodolite from some of the most important trigonometrical stations in the kingdom. Through a long catalogue of great instrument observers—from the eminent General Mudge to the non-commissioned officers of the corps who had completed the grand triangulation, sergeant Jenkins stands unrivalled. His reputation in this department of duty depends not on opinion but on a fact which has become a feature in the history of the operation; for his observations, computed comparatively with those of other observers, have, in their value, proved to be the best. During the London survey in 1848 he assisted sergeant Steel in taking observations from the station above the ball and cross of St. Paul's. He also distinguished himself in the use of the zenith sector at Southampton, and subsequently was second in charge of the re-measurement of the base on Salisbury Plain. In 1855 he was selected to exhibit at the Paris Exposition the scientific contributions from the ordnance survey, during which, he had

the rare distinction of offering explanations concerning the maps and instruments in his charge, to the Emperor; and also of being the bearer to Colonel James, as head of the national survey of the United Kingdom, a gold medal of honour and a first class silver medal, in testimony of the high appreciation with which the survey specimens of art, had been received in the French metropolis. At present he has charge under Captain Clarke of the persons employed at Southampton on the computations of the secondary and minor triangulations and of the correspondence with the parties engaged on that duty in the field.

Sergeant William Scott, after a service of twenty years, left the corps in November, 1845. He joined it a lad from the Hibernian School. His acquirements were varied and above the average of intelligent men. Whether as a surveyor, draughtsman, examiner, or superintendent, his work was always executed with quickness and accuracy, and he was frequently encouraged in his duty by preferment and eulogy. In 1839 he had the charge of the detail survey of the city of Limerick, and the preparation of the plans on the 5-foot scale. The survey was executed entirely by chain triangulation, in a manner so superior as to elicit the marked approbation of his officers. On retiring from the corps he commenced life anew as a civil engineer, and obtained good employment in the profession in England. His success, however, did not keep pace with his wishes and exertions, but sailing for the West, he was not long unknown in Canada. Under his superintendence the western division of the Great Western Railway was executed. On its completion in 1854, and when his connection with the undertaking had ceased, he was presented by the employes of the company at a public dinner, with a gold watch of the value of 500 dollars, as a token of high respect for his professional knowledge, and for his zeal and amiable firmness in directing the works. He now holds, through his own unassisted efforts, an honourable position in society, is esteemed for his attainments in science and engineering, and his prosperity has placed him in circumstances of moderate wealth.

Corporal William M'Lintock was a very clever artizan. An

ingenious machine was invented by him for ruling the lines of even shades on the copper, superseding its execution by hand engraving; and another for producing a finer, smoother, and more uniform impression of the characteristics of the maps. They are still in use at Southampton. The first, by a simple and beautiful process of mechanism is, when arranged, set in motion, and performs its delicate operations unaided, until the particular service assigned to it is accomplished. The other produces its advantages by an effective adaptation of the hydraulic principle and steam. Both inventions possess many excellences over the former modes of executing these fine and scrupulous details, and not only save much time and labour, but the chance of inaccuracy and irregularity in the performance.

Sergeant James Beaton has given much satisfaction as an observer. He is also well known for his successful daring in the building of structures for trigonometrical purposes. Since 1840 he has superintended the erection for these objects of at least fifty scaffoldings with stages, on the summits of towers or spires of churches, and in other prominent positions, in various parts of the British isles. Some of these structures have exhibited great skill, and the ingenious arrangement of the timbers, cordage, and fastenings, made the scaffolds with their platforms, objects alike of curiosity and architectural merit. The celebrated stages at Calaiswold near Bishopwilton, and Arbury Hill near Daventry, were massive and imposing structures. The former was 78 feet high, and 300 trees from the estate of Sir Tatton Sykes were used in its construction: the latter was 80 feet high, and the timber employed in it took a waggon and four horses for six days to collect it on the site. The scaffolds and stages on the steeples of Thaxted and Danbury churches in Essex were cleverly executed. The Thaxted one was a particularly difficult service, and accomplished at imminent personal risk. It was nevertheless a very artistic and beautiful work, and of sufficient interest to receive delineation in a London journal. It was built in April, 1844. The scaffold and stage were more than 102 feet in height, and

rose from the crown of the tower, which had an elevation of 100 feet from the ground. His most distinguished work was superintending, in 1848, the erection of the scaffolding and stage around and above the ball and cross of St. Paul's Cathedral, and which earned the reputation of being a "wonderful specimen of skill"¹⁵ and workmanship. The design for it was made by sergeant James Steel; but sergeant Beaton effected some important improvements in its details, which gave solidity and stability to the delicate fabric. His coolness, scrupulous care, and unflinching zeal in carrying on the work were astonishing, and during its progress he was visited by many architects, engineers, and professional men, who treated him with great courtesy, and eulogised his talent and courage. In the metropolitan sanitary survey sergeant Beaton took the trigonometrical observations at nine points of the district, the chief stations being on the cupola of the Colosseum, St. Luke's, Chelsea, the Pagoda Tower at Kew Gardens, and the Wimbledon and Highgate churches. The stage at the Pagoda was very difficult of erection. The tower is 140 feet high, and the pole from its apex rises to an elevation of 20 feet. Above this pole in a very skilful manner was the stage constructed, which rested upon four 30-foot spars based upon the cupola. While the work was in progress frost set in, and the roof, smooth as a sheet of glass, rendered the movements of the workmen very perilous; but the sergeant, equal to the occasion, by means of a circle of sheeting secured at the foot of the uprights, and the strewing of gravel on the planks, effected the service with his accustomed success. At Wimbledon spire the scaffolding from the base to the top was 85 feet, and from its neatness had so beautiful an appearance, that a drawing of it was transferred to the pages of the 'Illustrated London News.' It was built during the prevalence of a strong gale, and to insure security against an increased pressure of wind on the superstructure, 700 yards of chain and 500 yards of rope were fixed to the base of the main posts, and passed fourfold through the belfry windows, and made taut to the eight-bell frame by powerful tackling. The strength of

¹⁵ 'Companion to the British Almanac,' 1849, p. 37.

the fabric was afterwards severely tested, for a violent storm came on, and whilst large trees were thrown down and others were snapped off above ground, the stage on the fragile spire of the church weathered the hurricane. At Highgate church he built a similar stage above a spire of 60 feet, rising from a tower of 70 feet: this spire was architecturally embellished with turrets, pinnacles, &c., and eight flying buttresses. A storm set in here also, which shook the houses in the vicinity of the church. At midnight the sergeant was awakened by the wind, and dressing himself hastened to the top of the steeple. Nothing daunted by the oscillations of the stage he secured the instrument, and reefing a part of the canvas of the observatory saved it from destruction. This incident is given to show the sergeant's spirit and devotion to the service. At Gloucester Cathedral he erected on the tower a neat scaffolding and double stage, to receive his observatory, which was made to peer over the delicate pinnacles of the edifice. The pinnacles rose 52 feet above the roof, while the height of the building from the ground to the top of the spires measured 226 feet. This service was carried out with his usual ability and care, and the damage done to the cathedral in the fixing, and afterwards in the removal of the heavy timbers and stores, cost to repair it only the small sum of 1*s.* 4*d.* Similar scaffolds and double stages were constructed by him on the towers of Tewkesbury Abbey and Worcester Cathedral. From 1850 to 1855 he conducted the trigonometrical observations with the 2-feet theodolite from the top of Nelson's Monument on Calton Hill, from the turret over the crown-room at Edinburgh Castle, and from many mountain stations in Scotland. At one period of his service he was employed in the triangulation of Lewis, and underwent incredible hardships in its prosecution. Indeed, throughout his survey career of more than twenty-three years, his adventures and vicissitudes on mountain duty, in observing, in scaffold building, in travels by land and sea, exposed in camp to frost and snow, to violent winds, storms, and deluging tempests, belong almost to the romance of science. This is true not only with respect to the arduous and trying services of sergeant

Beaton, but to many others who, like him, have been allotted to the laborious duty of the great triangulation.

Colour-sergeant James Donelan was discharged in April, 1853, and, subsequently, for his excellent services received a silver medal and an annuity of ten pounds a year. From the year 1839 he was employed in charge of parties on mountains and at other stations, in making observations of angles and bearings, for the secondary and minor triangulation of Ireland. From December, 1841, to April, 1842, and from January, 1843, to late in 1852, he had the sole charge of Ramsden's three-feet theodolite, and made observations for primary triangles, some of whose sides were more than 100 miles in length. This class of observations previously had been performed by officers and mathematical assistants of great experience only, but the observations made by sergeant Donelan proved on calculation to be equal in accuracy to those of his predecessors. To his credit it must be recorded, that he was the first non-commissioned officer of the corps intrusted with the charge of a three-feet instrument. For more than twelve years he was encamped on remote mountain heights, or moving from one wild spot to another as the requirements of the service demanded. In this way he visited upwards of fifty trigonometrical stations in the British isles, many of which have become famous by the labours of General Roy, General Mudge, Captain Kater, and General Colby. Robust and physically adapted for laborious employment, he sustained with cheerfulness and evenness of temper and purpose, the arduous toils and difficulties of his duty, and the privations, discomforts, and atmospheric vicissitudes of a trying situation. His was necessarily a rugged life, but in all he acted like a true soldier, and was faithful and efficient alike as a sapper and an observer. Here it may be proper to mention that at Leith Hill, in Surrey, he received a visit from an eminent stranger, of whose position in society he was at the time unconscious. With the strict injunction that he was not to touch the instruments, or to interfere or speak while the observations were being conducted, the gentleman was admitted into the observatory. Sergeant Donelan

having closed the series of the arc to the Whitehorse-hill heliostat, entered into conversation with the stranger, and after an unrestrained reciprocation of thought and opinion on professional matters, he was embarrassed to learn that the visitor was no other than Professor Airy, the Astronomer-Royal. The visit was a beneficial one to the sergeant, for the professor, in a half-hour's stay, imparted to him much valuable information, and complimented him in a letter to Southampton for his care, industry, and ability. Among his later military services he was engaged for some months in the irksome operation of refinding the trigonometrical stations in Ireland. The duty was one of no common difficulty, but with his accustomed perseverance and precision, he succeeded in effecting it to the perfect satisfaction of his officers. He not only found the various sites, some of them almost hopelessly lost, but to render them easily accessible to future observers, described their characteristics and the physical features and bearings of the most remarkable objects in their vicinity. He is now employed as a civilian, observing with a 12-inch theodolite for the second and minor triangulation at a salary of 7*s.* 3*d.* a-day, in addition to his pension of 2*s.* 0½*d.*

Sergeant Joseph Longland served about seventeen years in the corps, was proficient in the field duties of the survey, and bore the character of being a fine draughtsman. Coupled with his charge of the drawing and tracing at Mountjoy, he superintended the revision of the engravings for Ireland. For several years he took the meteorological observations, directed the reduction of them for publication, and not only proved himself to be an excellent and careful observer, but introduced improvements in the meteorological registry. At Southampton, under the executive, he superintended, with singular efficiency and correctness, the staff of draughtsmen, civil and military, employed at the Ordnance map office. The vast range of his information, his habit of close reflection and studious application, rendered him a trustworthy and successful assistant. Thrice he has appeared before the public as a poet. His works bear the titles of 'Othello Doomed,' 'Bernard Alvers,' and 'Tre-

phely.' The two first are richly imaginative, displaying a versatility of style, an originality and wildness of idea and incident, a gracefulness and sublimity of diction, that bid fair, as he expands in experience and familiarizes himself with the compass of his powers, to give him a high stand among the poets. His last production, however, does not come up to the expectations of his admirers. It is too vague, eccentric, and improbable to meet with favour. Undoubted evidence it bears of spirit, thought, care, and ambition, but it lacks the charm—the merit of his earlier works. In 1855 he received a commission as Quartermaster in one of the foreign legions, but the labours to which he was subjected in the organization of a new corps with whose language he was utterly unacquainted, not suiting the bias of his mind for close sedentary occupation, induced him to resign. The step was accompanied with pecuniary inconveniences. Fairly thrown on the world, with good talents and proper ambition to start with, there is little doubt but that his energy of character will introduce him to employment which will make up for the honourable position he felt it expedient to sacrifice.

Sergeant Donald Geddes possessed varied ability both as a surveyor and a mechanic. He was also a clear-headed and suggestive clerk of works, and not without pretensions as an architectural draughtsman. When discharged in the summer of 1853, he was in subordinate charge of the electrotype apparatus and copper-plate printers at the Ordnance map office at Southampton, under Captain W. D. Gosset, R. E., in which, through his assiduity and intelligence, the process of producing the copper for engraving was carried out very successfully. In attending to this duty his attention had been much engaged in scientific investigations and chemical experiments, and his diligent application made him intimately acquainted with the sciences of galvanism and electricity. Frequently on these subjects he lectured at the Polytechnic Institution at Southampton to large audiences, and his addresses were invariably reported in their entire length in the local papers. In January, 1852, he was honoured by a

request to *open the session* of the institution with a lecture. This sergeant Geddes complied with. His subject was "The Advantages of Scientific Knowledge," and it was received by a crowded assembly with enthusiasm. "The eloquence, ease of illustration, and fine talent of the lecturer, were surprising, and professors with a stream of initial titles to their names could not more have instructed and delighted their audiences at the royal and other metropolitan institutions than did sergeant Geddes."¹⁶ An incident occurred on this occasion which, from its remarkable character and effects, should not be omitted. The lecturer in alluding to the electric-telegraph, drew attention to the fact that friendly salutes had, by its agency, been fired between the coasts of England and France. "Let us only imagine," he continued, "that this wire were carried across the channel and attached to the cannons of Paris or Madrid; let us wish to salute them on some great occasion, and by the simple touch of our wires it is done!" Here the lecturer united his wires, and lo! three pieces of artillery were fired in the adjacent grounds, to the great astonishment of the audience; but though the experiment was successful, it was attended by one of those striking accidents which, instead of damping the interest of the assembly, assisted to increase its zest and to prolong its hearty applause. The distance that the guns were likely to be out of the road of doing harm was not accurately ascertained, and when the explosion took place the crash that ensued embraced the destruction of more than 100 panes of glass in the Polytechnic building! At the invitation of Mr. Andrews, the Mayor of Southampton, he afterwards delivered a lecture at St. John's House, Winchester, on voltaic and magnetic electricity. "The lecture, so interesting and yet so practical in its illustrations, accompanied by experiments so brilliant and successful, was listened to with the most earnest and intelligent attention."¹⁷ Mr. Andrews and Miss Smith—the heroine of the 'Amazon'—were present; and sergeant Geddes, during his sojourn at Winchester, was the honoured

¹⁶ 'Hampshire Advertiser,' January 17, 1852.

¹⁷ 'Hampshire Chronicle,' March 13, 1852.

guest of the mayor, and favoured with the amiable and intelligent company of the accomplished lady. In March, 1855, he delivered perhaps his best lecture at Southampton in the Polytechnic Institution, on the "Monumental Remains of Egypt, Assyria, and Greece." It was illustrated by drawings and photographs of striking subjects—gleaned chiefly from Layard's remarkable discoveries. There was also a view of Attica, nine feet long, sketched by Mrs. Bracebridge, celebrated for her heroic devotion and gentleness to our sick troops in the hospitals on the Bosphorus. The hall was filled to inconvenience, and he was encouraged by the presence of many of the notabilities of the city. A respectable local paper spoke of the lecture as being comprehensive and "greatly enhanced in effect by his not having to refer to a single note throughout." The journal further observed, that "the lecture was altogether one pleasing flow of words, strictly appropriate, forcible in a scientific point of view, and convincing, as in all other respects, to the inquisitive mind of an audience excited to the highest pitch of attention."¹⁸ On several occasions sergeant Geddes has contributed to the columns of the 'Hampshire Advertiser' original and popularly written articles on art and science. In the erection of the new gaol at Southampton, he held the office of clerk of the works; and he now fills, by the patronage of Colonel James, the superintendent of the survey, a similar appointment in connection with the building of fire-proof offices and stores at the Ordnance map office, for which a sum of 8,000*l.* has been voted by Parliament.

Sergeant-major James Steel.—From the first he had a taste for the investigation of abstruse questions of science and philosophy, and his strong mind and perseverance, his power of application and fulness of resource, have made him acquainted with a fund of knowledge and information not commonly possessed by men in his sphere of life. As a mathematician he holds a fair reputation for proficiency and accuracy, but it is chiefly with the work of the triangulation and astronomy he has most

¹⁸ 'Hampshire Advertiser,' March 31, 1855.

distinguished himself. His early service was passed on severe hill duty. Ben Auler and Creach Ben were his first mountain stations. There he experienced a round of the varied hardships and dangers peculiar to a *trig* camp.¹⁹ Possessing a buoyant temper and a hardy constitution he for many years bore with happy composure all the stern trials and changes to which the service exposed him, and carried on his duties with unrelaxed ardour and success. At Creach Ben he learnt the use of the instrument, and succeeded Lieutenant Hamley, R. E., in its charge in 1841. He is the first non-commissioned officer of the corps who used one of the larger instruments. In prosecuting his new trust, his travels embraced all parts of the British Isles. Now he would have his station on the mountain top, now on some craggy peak, and anon staged on the tower of some majestic castle or cathedral. This again he would leave for service on some stormy coast, or to perch his observatory on the slender weather-worn spire of some quiet village or city church. At Norwich cathedral his observatory rested on a scaffolding 315 feet from the floor of the building—nearly the height of St. Paul's, but without the advantage of a dome at the base, to diminish the apparent distance of the observer from the ground. Here he used to creep into the "nest" through a hole in its floor. Some of the men were weeks before they could reach the top, while it was the duty of sergeant Steel and others to ascend it, and carry on the work in the most tempestuous weather and in the darkest nights. The oscillations of the structure were frequently very violent, but the observer, cool and fearless, continued to complete his arcs and to record the movements of the stars. In one of the storms which broke over Norwich an architect paid the sergeant a visit, but the vibration of the "nest" appeared so alarming to him, that through his representation a peremptory order was given to abandon the station, by removing the instrument and scaffolding from the spire. At Beachy Head the sergeant spent a winter season, where he was exposed to cold the bitterest he had ever expe-

¹⁹ See illustration of the encampment at Creach Ben, 'Aide Memoire,' iii., p. 614.

rienced. This was in March, 1845, and at midnight, when the temperature was 25° below freezing-point, he did not forsake his work, but continued to observe the elongations of the pole-star, protected only by the canvas sides of his frail observatory. In moving from place to place he acquired much skill and facility in the construction of scaffolding and stages, and some of these fabrics, from his own designs, have only perhaps been excelled by the interesting works of sergeant Beaton. Soon after this, sergeant Steel, instructed by his officers in the use of the transit and zenith sector instruments, was employed during periods of five years in carrying on a series of astronomical observations with Airy's zenith sector for the determination of the latitude of various trigonometrical stations used in the Ordnance survey of the British isles. Out of the twenty-six sector stations he visited seventeen, at fifteen of which he took the whole of the observations with the exception of a few at Balta, and about one-half at Southampton, which were made by corporal William Jenkins. The record of his observations, comprising about 700 quarto pages of closely-printed matter, attest both his industry under difficulties, and his talents. In this honourable service he displayed a quickness of perception, an accuracy in the manipulation of his instrument, and a skill and dexterity in the taking and registration of his observations, that place him in an enviable light even among scientific men. The most important work with which the name of sergeant Steel is *popularly* associated is the triangulation of London for the Sewers' Commissioners. He it was who designed the beautiful scaffolding around and above the ball and cross of St. Paul's, and who for four months carried on his duties from the observatory, cradled above the cross, with so much spirit and zeal, notwithstanding at times its alarming oscillations. In that period he made between 8,000 and 10,000 observations, and on the completion of the service superintended the removal of the scaffolding, which was found to be an operation even more difficult and hazardous than its erection. Another important work superintended by him, was the remeasurement of the base line on Salisbury Plain by

means of the compensation-apparatus, which he conducted with his accustomed fidelity. In this delicate and peculiar duty his readiness of invention and perseverance enabled him to master, with complete success, the various obstacles he met with in its progress. So important a charge as this was never before intrusted to the responsibility of a non-commissioned officer, for heretofore the base lines were measured only by general officers of great scientific merit and experience. That on Salisbury Plain was executed by General Mudge in 1794, and its remeasurement was, in its operation and results, fully equal, in point of skill and correctness of execution, to any of its predecessors. Subsequently he took a leading part in the survey of the Queen's estate at the Isle of Wight, for which Prince Albert presented him with a cheque for ten pounds "as a mark of His Royal Highness's approval of his attention and care in making the survey of Osborne." On the 14th August, 1855, after a stay of ten days on the summit of his old acquaintance Ben Lomond, he arrived at Arthur's Seat, where the zenith sector was awaiting him. No time was to be lost in working it, as a measure of the local attraction of the mountain—to be supported by about 850 determinations of latitudes and theodolite observations at three stations—was to be delivered for the consideration of the *savans* of the British Association, at their gathering on the 15th September. Quickly rearing his instrument, and obtaining the loan of a chronometer from the astronomer-royal of Scotland—Piazzi Smythe—he threw his whole energy into the operation, labouring with his untiring sappers for twelve, sixteen, and sometimes twenty hours a-day. Thus robbing nature of her wonted rest, he registered by the 13th, with his usual accuracy, the necessary number of observations, but the result by calculation did not turn out as was expected. An additional spur was thus given to scientific inquiry, experiments were renewed and investigations made, which ended in establishing, to some extent, the existence of a disturbing power in that romantic hill, besides its understood attraction, to influence the plumb-line. Of that other disturbing force the cause

is still a mystery, but as Arthur's Seat is in the vicinity of the Modern Athens, and is daily visited by professors and students of geology and other branches of natural philosophy, there is every chance of this strange phenomenon being sooner or later discovered and explained.²⁰ Of his services Colonel James thus wrote: "The observations were made by sergeant-major Steel, during the months of September and October last; 220 double observations of stars were taken at each station, and the results have justified my confidence in him as an observer."²¹ Sergeant Steel's services and attainments have always been of the highest class for usefulness and integrity, and his attention to the public economy was marked by a penetrative species of calculation, which made him more than a match for such contractors as it was occasionally his duty to engage. Under

²⁰ It would be a pity to overlook the notice of an incident which occurred in connection with this astronomical service. When Steel left Southampton it was arranged he should hut himself with Mr. Donelan—formerly of the sappers—till the latter had finished his azimuthal duties on Ben Lomond, and then post away to Arthur's Seat with Donelan's barometer, chronometer, camp and party. Meanwhile a change was decided on—Donelan remained on the mountain with his instruments and party, and Steel shot off to Edinburgh. He could not however proceed with the observations without a chronometer, and as time was pressing, he could not wait till one were conveyed to him from the map office. Calling upon the Astronomer Royal with a credential from Captain Kerr of the royal engineers, Steel solicited the loan of a chronometer to enable him at once to commence operations. Very few instruments had the professor which were not in actual use, and except a pocket chronometer he had no instrument measuring sidereal time such as Steel wanted. Strongly interested in a matter so important, the professor was determined, could Edinburgh prevent it, that the sergeant should not be delayed an instant; and accordingly he wrote to the principal opticians—Adie and Son—and to Mr. Bryson, the chief clockmaker, begging, "for the scientific credit of the city of Edinburgh," that the sergeant should be temporarily furnished with the instruments he required. Whatever could be given was readily placed at the service of the military astronomer, but, it was not in the power of the Scotch metropolis—learned and scientific as are its sons—to supply a sidereal chronometer! To make the best amends for the absence of so indispensable an accessory, the obliging professor, although he daily used his own pocket chronometer, lent it to the sergeant for one week, by which time an efficient instrument had reached him from Southampton.

²¹ Colonel James, 'On the deflection of the plumb-line at Arthur's Seat,' read before the Royal Society, February 21, 1856.

the years 1848, 1849, and 1850, the valuable services of this non-commissioned officer are more particularly alluded to in connection with the special services upon which he was then employed. It is only a poor act of justice here to mention that in this instance, as in all others in which non-commissioned officers and men have signalised themselves, the corps is deeply indebted to the Royal Engineers for information, direction, opportunity, patient instruction, and an interest in the development of individual character and talent; so that, for nearly a quarter of a century, the officers have assigned to them the performance of many important services, which from the accuracy and integrity of their accomplishment have greatly enhanced the corps in the confidence of their officers and in public esteem. Sergeant—now sergeant-major—Steel is the chief non-commissioned officer of the corps on the survey, and is stationed at Southampton, where, under Captain Clarke, he is superintending the calculations for the publication of the principal and secondary triangulation of the United Kingdom.

Colour-sergeant William Campbell.—Joined the corps in 1829, and early distinguished himself by his attainments. This led to his selection, when quite a junior non-commissioned officer, to give instruction to the inspectors of national schools in Ireland in surveying and levelling. These gentlemen were appointed to watch over the schools in the twenty-five educational districts into which Ireland was divided, to carry out the spirit and intentions of Lord Stanley's plan for Irish education. Sergeant Campbell spent two months in training the superintendents, during which time he was brought into contact with noblemen and distinguished personages, all of whom uniformly treated him with marked courtesy. On completing the service he was rewarded in 1838 by the Commissioners of Education, of whom the Duke of Leinster was the chief, with a handsome case of drawing-instruments. His pupils also, in testimony of their esteem for his attention and ability, presented him with a purse of ten sovereigns, accompanied by a flattering address. When removed to the survey of England, his experience and the wide range of

his information qualifying him for more extended usefulness, he was appointed, under the executive officer at Southampton, to fill the second subordinate post of importance on the duty. There he had charge of the correspondence, accounts and returns of all parties employed in the principal triangulation, and was responsible for all the money received for their payment, which at the time amounted to about 6,000*l.* a-year. He was also in charge of the calculation and preparation of the initial spirit-levelling, showing the relative altitude of land, which forms the basis of the whole of the contouring and vertical survey of Great Britain and Ireland. The importance of this duty, and the fidelity with which it was executed, gave him a high stand in the estimation of his officers for intelligence and resource. The special survey and mapping of Southampton for sanitary purposes was completed under his superintendence, with Captain Yolland as director. Under that officer he had charge of the construction and preparation of the Block-plan of London for the Metropolitan Commissioners of Sewers, comprising 847 sheets on the 5-feet scale, and also a plan on the 12-inch scale, containing 44 sheets, which was subsequently engraved at the Ordnance map office for the commissioners. By Captain Beatty he was intrusted with a like superintendence of the 10 and 12-feet plans of seventeen other towns, surveyed for local boards of health by parties under the direction of the captain. In conducting the survey of Southampton, he became popular with the citizens, and was commended by the corporation. By some of the municipal authorities he was called upon to suggest the best means of supplying the town of Southampton with water. With the sanction of his commanding officer he made a minute examination of the sources from which the town could be provided, and furnished his opinion in a lucid and spirited report on the propriety of selecting the Otterbourne Spring.²² Twice sergeant Campbell was examined on his project by a committee of the House of Commons; but the bill was

²² The full report is given in the 'Hampshire Independent,' December 8, 1849

eventually lost, not from his being unable to afford proof of its practicability and preference of selection to other springs, but from want of zeal and unanimity on the part of the corporation to prosecute the scheme. When the Society of Associated Engineers was formed, several condemnatory letters and articles appeared in various public journals prejudicial to the Ordnance system of employing officers of engineers and soldiers of the royal sappers and miners to execute the government surveys; and the 'Builder' was indefatigable in promulgating the statements. Sergeant Campbell undertook a defence of the Ordnance system; and fortified as he was by facts and accurate results, a thorough acquaintance with the effective working of the survey machinery, and a facility of expressing his views with force and clearness, his four well-known letters to the 'Builder' in 1849, tended in great measure to terminate the controversy, and to render the operations of the associated society innocuous to the corps. After serving on the national surveys for more than twenty-two years, and reaping its highest honours and rewards, he was discharged in July, 1852, on a pension of 1s. 11½d. a day. On parting with him, Colonel Hall recorded his opinion of the very satisfactory manner in which sergeant Campbell had performed all the responsible and trustworthy duties so long confided to him, and the great value of his services to the survey, both as an able superintendent and a first-class assistant. His regimental pay and allowances were 7s. 3d. a day, with quarters &c.; and since his retirement he has been awarded, through the influence of Colonel Hall, an annuity of 10l. a year, and a silver medal for "meritorious service" in the corps. From the ranks of the sappers he passed into comfortable employment in civil life. Out of a tiring number of candidates who offered themselves, with brilliant testimonials, for the office of cashier to the Peninsular and Oriental Steam Navigation Company, he was selected to fill it, at a salary of 210l. a year; since which—such has been his probity and efficiency—his income has been increased to 300l. a year.

Quartermaster William Young.—This rank was conferred

upon Mr. Young in April, 1853, as a reward for his talents and pre-eminently useful services. He joined the corps from the Hibernian school in July, 1825, and soon, by study and application, became a well-informed mathematician. In 1830 Captain Henderson confided to him the calculations of the secondary and minor triangulation and trigonometrical altitudes of one of the districts in Ireland, in which, from his quickness, mental vigour, and extraordinary power of memory with reference to the logarithms of numbers, and the results of various calculations, his services were found, even at this early period, to be exceedingly advantageous. Promotion, however, being slow, it was not until 1838 he became a *full* non-commissioned officer; and soon afterwards, he succeeded a civil gentleman of experience and ability in conducting, under the direction of his officers, the computing department for the survey of Ireland. In that country his duties were always onerous and responsible; and the care, rapidity, and correctness with which they were executed, marked him out for higher employment in England. At Southampton he was intrusted with duties never before performed by a non-commissioned officer. Next to his officers he held the most important post on the survey, and fulfilled its requirements with no common ardour, integrity, and accuracy. For fifteen years he superintended a large force of computers and others, employed in carrying out the various calculations for the principal, secondary, and minor triangulation, the preparation of diagrams, the calculations of latitudes, longitudes, and meridional bearings, also the computation of distances and positions for the hydrographical office to enable the Admiralty to project the nautical surveys of the coast of the United Kingdom. With these scientific duties was connected the computation of trigonometrical and meridional and parallel distances for the surveys and large plans of towns. In 1844, when the Admiralty sanctioned Mr. Airy's project for the chronometrical measurement of an arc of parallel between Greenwich and Valentia Island, the professor was requested to alter his formulae, to enable the calculations to be carried out more correctly.

He accordingly supplied new formulæ, which being submitted to the most rigid tests, it was found that not only "none of the approximate processes given by the various writers on geodesy were sufficiently exact to reproduce the original assumed latitude, longitude, and bearing, on carrying the calculations to the point at which they commenced," but that those of the royal astronomer's also failed to accomplish the object, "until it was found that the normal, or radius of curvature perpendicular to the meridian for the latitude of the given station, must be used in that of the determination of the second station, and the normal for the latitude of the second in the determination of that of the third, and so on, instead of using any *approximate radius*." This was ascertained by sergeant-major Young, "after repeated attempts had been made, without success, to alter or modify the various approximate processes which had been tried, so as to cause them to reproduce the assumed data, on continuing the computations to the original point; and it was then also discovered by him, that in addition to obtaining accurate results, the calculations might be materially abridged by using the normal, as it then became unnecessary to convert the difference of longitude on the assumed or fictitious sphere used in the calculations, to the corresponding difference on the spheroid."²³ The reversal of the steps of these improved formulæ also gave the means of finding accurately, when the latitudes and longitudes of any two points are known, the distances between them and their reciprocal bearings.²⁴ In publishing the work called 'Lough Foyle Base,' Captain Yolland acknowledged the services rendered in its progress by sergeant-major Young, "in charge of the computing branch" at Southampton, "for various improvements in the calculations, and for the rigid manner in which they were performed." It was moreover added, that to his "quickness, accuracy, and skill in mathematical calculations, the survey is much indebted."²⁵

²³ 'Lough Foyle Base,' by Captain Yolland, R.E., pp. 147-149.

²⁴ Ibid., p. 151.

²⁵ 'Lough Foyle Base,' Pref., viii.

He also afforded material aid, being Captain Yolland's principal assistant, in the reduction and preparation for publication, of the astronomical observations with the zenith sector for the determination of the latitudes of twenty-six different trigonometrical stations used in the Ordnance Survey. The published work comprises 1,009 quarto pages of closely printed tabulated matter, displaying an array of results that must have cost both chief and assistant a great sacrifice of mental energy and unwearied application to make the necessary calculations and deductions. For some years Mr. Young superintended, under an officer of engineers, the compilation and calculations for the publication of the grand triangulation of the United Kingdom, and the arcs of the meridian connected with it. In addition to these scientific duties, he had charge of an official correspondence, and the management of large public accounts, the magnitude of which may be judged by the fact that in four years alone more than 100,000*l.* passed through his hands—50,000*l.* at least in personal payments, and the remainder in issues through him, to other persons rendering their accounts to him for examination. This brief abstract affords sufficient evidence of the extent and responsibility of his duties, which, Colonel Hall reported, “could only have been performed, in the highly-efficient manner in which they had been, by the possession on his part of great mathematical knowledge and aptitude for applied sciences.” In some respects to compensate him for his services, he had, when a non-commissioned officer, been awarded the highest military rewards and allowances that the regulations permitted: viz., 4*s.* a day and an annuity of 10*l.* a year and a silver medal. These, with his sergent-major's pay, made his annual allowances reach about 170*l.* a year, exclusive of his regimental advantages of excellent quarters, fuel, and clothing. Even this, the ultimate stretch of military reward, was wholly incommensurate with his acquirements and deserts; and to retain his services in the department, it became necessary that a special course should be taken to better his station in the corps. This was successful;

and by the cordial and generous advocacy of Sir John Burgoyne, a commission was obtained for him to the rank of Quartermaster, by which he is placed, in a pecuniary view, in a position above the chief civil gentlemen on the survey, and on a par nearly with the lieutenants of engineers employed on it. Throughout his career, it is not a little curious to add, that he was the first non-commissioned officer on all occasions selected to receive the advantage of all the additional honours and rewards conferred on the survey companies, for he was the first who received the 4s. a day survey pay, the first appointed sergeant-major, the first medallist, the first annuitant, and the first quartermaster.

Of the general merits and services of the survey companies, both General Colby and Colonel Hall, R.E., have spoken in high terms. In September, 1846, the former officer, who for twenty-two years had commanded them, called attention to their peculiar habits of order, intelligence, integrity, and zeal for the public service. Had it not been for these qualifications, the great reduction in the number of officers from forty-five to nine must have been ruinous to the survey. "In fact," adds the General, "the royal sappers and miners on the survey are intrusted with the charge of difficult and important works without the advantage which other soldiers have, of being under the control of officers who have ample time to direct them in all cases requiring knowledge and consideration." Colonel Hall's testimony is an echo of the General's matured opinion. He speaks of the non-commissioned officers particularly, as being men of very superior attainments, and highly valuable to the Ordnance Survey, and that when discharged, they constantly receive employments in situations of considerable trust and importance at high salaries, which they fill with credit and success. In August, 1854, Colonel Hall ceased his connection with the survey, and was succeeded by Major, now Lieutenant-Colonel James, R.E. In his parting address he warmly eulogized, in general terms, both civil and military, for the services they had rendered to the national survey, and

alluded with modest pride to a few of the advantages he had obtained for those who had so faithfully served under him. "For the military," he wrote, "I have had the pleasure of procuring three important appointments: viz., a quartermaster with a high rate of working pay in addition to his regimental pay; a permanent sergeant-major, and a permanent quartermaster sergeant. These are prizes two years ago unknown in the survey companies; which, whilst tending to raise the tone of the sappers generally, should act as inducements to young men to strive to distinguish themselves for early promotion, and for meriting further indulgences."

APPENDIX.

APPENDIX I.

WARRANT FOR FORMATION OF THE FIRST COMPANY OF THE CORPS.

GEORGE R.

WHEREAS it hath been represented by the Governor, Lieutenant-Governor, and Chief Engineer of our garrison and fortresses of Gibraltar, that many advantages would arise to our service if the fortifications, buildings, and repairs in that place, which are under the department of the Ordnance, were performed and carried on for the future by a military company of artificers, and that besides a saving of expense, the said company, by being subject to military command and discipline, would be more orderly and regular in their behaviour than has been hitherto experienced in the hired artificers employed there: Our will and pleasure therefore is that a company of artificers be forthwith raised, formed, and from time to time recruited with such soldiers serving in any of our regiments doing duty at Gibraltar, as may be fit for that purpose, being volunteers, and having the consent of the Colonels or Field Officers commanding such regiments respectively, or with any other men properly qualified, who shall have been bred to the trades of stonecutters, masons, miners, lime-burners, carpenters, smiths, wheelers, or gardeners, and who shall be duly enlisted in the said company, which shall not exceed the number of sixty-eight, non-commissioned officers and drummers included, with the respective pays mentioned in the establishment hereunto annexed. Our will and pleasure also is, that as soon as the said Company is raised and completed, you do cause them to be employed in performing and carrying on the fortifications, buildings, and repairs at Gibraltar, and to be instructed and paid, from time to time, by the paymaster of the Ordnance there, upon the same footing as the rest of our troops in that garrison are paid. And you are to cause such of the artificers hired in England, and now employed on the works at Gibraltar, as shall not enlist in the said company, to be sent back to England as soon as the nature of the service will admit. Our further will and pleasure is, that the said company shall be under the command and direction of the chief engineer of the said garrison for the time being, who is hereby appointed captain of the said company, and of such

engineer or engineers serving at Gibraltar, as he shall find necessary for his assistance in the command of the said company. And we do hereby authorize you to pay, or cause to be paid, unto the non-commissioned officers and private men composing the said company, such allowance per diem for working money as you shall think fit, not exceeding two reals per diem each for the days they are actually employed on the fortifications, works, and repairs, over and above their established pay; the expense of the whole to be inserted in your estimates, and to be presented to Parliament.

Lastly, we do hereby require the Governor, Lieutenant-Governor, or Officer commanding in our said Garrison now and for the time being, to be aiding and assisting to the utmost of their power in carrying these our orders into execution; and for so doing, this shall be as well to you, as to them, and to all others concerned, a sufficient warrant.

Given at our Court of St. James', the 6th day of March, 1772, in the 12th year of our Reign.

By His Majesty's command,

(Signed) ROCHFORD.

To our Trusty and well-beloved Counsellor Henry Seymour Conway, Lieutenant-General of our Ordnance, and to the rest of the principal Officers of the same, and to the Master-General, Lieutenant-General, and the principal Officers of our Ordnance for the time being.

ESTABLISHMENT of a MILITARY COMPANY of ARTIFICERS to serve in the GARRISON and FORTRESS of GIBRALTAR.

	Per Diem,			Per Annum,		
	£.	s.	d.	£.	s.	d.
Captain, Chief Engineer of the garrison for the time being.						
1 sergeant and as adjutant	0	3	0	54	15	0
3 sergeants, 1s. 6d. per diem each	0	4	6	82	2	6
3 corporals, 1s. 2d. per diem each	0	3	6	63	17	6
60 privates or working men, 10d. per diem each .	2	10	0	912	10	0
1 drummer	0	0	10	15	4	2
68 clothing, 2d. each per diem	0	11	4	206	16	8
Total	3	13	2	1,335	5	10

APPENDIX II.

MASTERS-GENERAL of the ORDNANCE in command of the Corps, since its formation in the year 1772.

JOHN, MARQUIS of GRANBY	1 July, 1763.
GEORGE, VISCOUNT TOWNSEND	1 Oct., 1772.
CHARLES, DUKE of RICHMOND, K.G.	1 Jan., 1782.
GEORGE, VISCOUNT TOWNSEND	1 April, 1783.
CHARLES, DUKE of RICHMOND, K.G.	1 Jan., 1784.
CHARLES, MARQUIS CORNWALLIS, K.G.	13 Feb., 1795.
JOHN, EARL of CHATHAM, K.G.	16 June 1801.
FRANCIS, EARL of MOIRA	14 Feb., 1806.
JOHN, EARL of CHATHAM, K.G.	4 April, 1807.
HENRY, EARL of MULGRAVE	5 May, 1810.
ARTHUR, DUKE of WELLINGTON, K.G., G.C.B., G.C.H.	1 Jan., 1819.
HENRY, MARQUIS of ANGLESEY, K.G., G.C.B., G.C.H.	1 April, 1827.
WILLIAM CARR, VISCOUNT BERESFORD, G.C.B., G.C.H.	28 April, 1828.
SIR JAMES KEMPT, G.C.B., G.C.H.	30 Nov., 1830.
SIR GEORGE MURRAY, G.C.B., G.C.H.	18 Dec., 1834.
RICHARD HUSSEY, LORD VIVIAN, G.C.B., G.C.H.	4 May, 1835.
SIR GEORGE MURRAY, G.C.B., G.C.H.	8 Sept., 1841.
HENRY, MARQUIS of ANGLESEY, K.G., G.C.B., G.C.H.	8 July, 1846.
HENRY, VISCOUNT HARDINGE, G.C.B.	8 Mar. 1852.
FITZROY, LORD RAGLAN, G.C.B.	30 Sept., 1852.

The appointment of Master-General was abolished on the 25th May, 1855. The military control of the royal sappers and miners was consequently transferred to the General Commanding-in-Chief of the army; and the civil, to the Minister for War.

CHIEF ENGINEERS and INSPECTORS-GENERAL of FORTIFICATIONS, second in command of the Corps, from 1787. (From 1772 to 1788 the officers in command of companies corresponded direct with the Master-General and Board.)

General SIR WILLIAM GREEN, Bart.	15 Nov., 1786.
" ROBERT MORRE	1 May, 1802.
" GOTHER MANN	23 July, 1811.
Major-General SIR ALEXANDER BRYCE, C.B., K.C.H.	28 Oct., 1829.
" ROBERT PILKINGTON	5 Oct., 1832.
Lieutenant-General SIR FREDERICK MULCASTER, K.C.H.	July, 1834.
" SIR JOHN FOX BURGOWNE, Bart., G.C.B.	July, 1845.

LIEUTENANT-GENERAL of the ORDNANCE.

General SIR HEW D. ROSS, K.C.B., during the absence of LORD RAGLAN in Turkey 2 May, 1854 to 25 May, 1855, when the appointment was cancelled by transferring the control of the ordnance corps to the Commander-in-Chief and Minister for War.

APPENDIX III.

ADJUTANTS and BRIGADE-MAJORS of the CORPS at HEAD-QUARTERS,
from 1795.

Lieutenant	JOHN ROWLEY	. . . . .	Adjutant	. . . . .	15 May, 1795.
Captain	JOHN THOMAS JONES	. . . . .	"	. . . . .	1 Jan., 1807.
"	GILBERT BUCILANAN	. . . . .	"	. . . . .	1 July, 1809.
"	RICE JONES	. . . . .	"	afterwards Brigade-Major 20 Dec., 1814.	1 Feb., 1812.
"	FRANK STANWAY	. . . . .	Brigade-Major	. . . . .	8 June, 1830.
"	EDWARD MATSON	. . . . .	"	. . . . .	14 Feb., 1831.
"	HENRY SANDHAM	. . . . .	"	. . . . .	24 May, 1841.
"	JOHN WALPOLE	. . . . .	"	. . . . .	1 June, 1848.
"	FREDERICK AUGUSTUS YORKE	. . . . .	"	. . . . .	17 Feb., 1854.

ASSISTANT ADJUTANT-GENERAL.

Lieutenant-Colonel	FREDERICK AUGUSTUS YORKE			17 Dec., 1855.
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ACTING ADJUTANTS at WOOLWICH to assist the BRIGADE-MAJOR.

Lieutenant	ROBERT DASHWOOD			9 Nov., 1835.
"	FREDERICK AUGUSTUS YORKE	. . . . .			4 Nov., 1839.
"	THEODOSIUS WEBB	. . . . .			1 Aug., 1844.
"	GEORGE ROSS	. . . . .			16 July, 1846.
"	FITZROY SOMERSET	. . . . .			1 April, 1852.
"	FRANCIS EDWARD COX	. . . . .			29 May, 1854.
"	GEORGE REID LEMFRIERE	. . . . .			12 May, 1855, to 31 Mar., 1856,
					when the appointment ceased, in consequence of the amalgamation of head-quarters with the establishment at Chatham.

DIRECTORS ROYAL ENGINEER ESTABLISHMENT at CHATHAM from its for-
mation in 1812.

Major	CHARLES WILLIAM PASLEY	. . . . .			23 April, 1812.
Colonel	SIR FREDERICK SMITH, K.H.	. . . . .			1 Jan., 1842.
"	HARRY D. JONES	. . . . .			1 May, 1851.
"	HENRY SANDHAM	. . . . .			1 Mar., 1855.

ADJUTANTS of the CORPS at CHATHAM.

Second-Captain	JOHN M. F. SMITH*	. . . . .			1 Dec., 1812.
"	RICHARD ZACHARY MUDGE	. . . . .			21 Mar., 1815.
"	WILLIAM REID	. . . . .			13 Mar., 1816.
"	HARRY DAVID JONES	. . . . .			22 April, 1824.
"	EDWARD MATSON	. . . . .			14 Jan., 1826.
"	JOSHUA JERR	. . . . .			14 Feb., 1831.
"	HENRY SANDHAM	. . . . .			1 Aug., 1837.
"	MONTGOMERY WILLIAMS	. . . . .			24 May, 1841.
"	ST. GEORGE V. WHITMORE	. . . . .			1 May, 1843.
"	JAMES LYNN	. . . . .			18 June, 1846.
"	CHARLES FANSHAW	. . . . .			26 Jan., 1847.
"	ST. GEORGE ORD	. . . . .			1 Jan., 1852.
"	FITZROY SOMERSET	{ Joint			17 Feb., 1854.
"	FRANCIS EDWARD COX	{ Adjutants }			17 Dec., 1855.

* Appointed Assistant-Director, 16th March, 1815.

APPENDIX IV.

- | Date of
Appointment. | SUB-LIEUTENANTS. |
|-------------------------|---|
| 1806 Dec. | 1. JOHN PALMER, died at Chatham March 9, 1814, aged 77. |
| " | JAMES SMITH, died at Portsmouth October 10, 1828, aged 84. |
| " | WILLIAM BROWNE, died at Devonport February 21, 1833, aged 85. |
| " | ANTHONY HAIG, died at St. Helier's, Jersey, January 9, 1836, aged 88. |
| " | JOHN EAVES, died in 1851, aged 89 years. |
| 1807 June | 1. DAVID FALCONER, died at Elgin May 20, 1833, aged 62. |
| Nov. 12. | ROBERT DAVIE, was commissioned into the corps from the rank of quartermaster-sergeant in the royal artillery, in which he had enlisted in April, 1778. Served at the siege of Cadiz and battle of Barrosa. Was a few years on the recruiting service in Ireland, and enlisted upwards of 1,200 recruits for the corps. Died at Woolwich March 22, 1830, and the humble stone which marks the spot where his remains lie, alludes, with excusable particularity, to the fact of his success on the recruiting service. |
| " | GEORGE ROBINSON, died at Carlisle October 8, 1821. |
| 1809 May 22. | CHARLES MILLAR, died at Devonport March 10, 1832 |
| 1811 June | 1. THOMAS LONGHAW, died September 29, 1825. |
| " | ALEXANDER MUNRO, died at Stepney, January 19, 1834. |
| " | ALEXANDER ROSS, died at Nairn, February 7, 1826. |
| " | JOHN DUNBAR, died at Guernsey March 23, 1812. |
| " | JOHN SMITH, was much employed on the recruiting service. In 1812, when the disturbances took place at Manchester, General Dirom ordered the recruiting parties of artillery and sappers to be placed under his orders, with six field-pieces from Lord Grey's, to assist in keeping the malcontents in order. His conduct was much praised on the occasion, and General Dirom made a report of it to the Commander-in-Chief. |
| " | PATRICK WHELAN, died at Kildare May 21, 1825. |
| " | ROBERT GIBB, served at Ciudad Rodrigo and Badajoz, also in the operations in East Catalonia, including the siege of Tarragona, and was afterwards at Genoa and Gibraltar. Died at Loches, September 4, 1828. |
| July | 1. DESKFORDE CHARLES, from sergeant-major royal artillery, in which he had served more than twenty-one years, and was present at Dunkirk and Newport in 1793, and the action of May 18, 1794. Died at Millingham December 7, 1847, aged 80. |
| " | CHARLES BOOTH, died at Freinada March 4, 1813. |
| " | ALEXANDER W. WALLACE, from royal artillery, in which he had served fifteen years, and was in the West Indies from 1796 to 1802. In the sappers he was wounded at Badajoz. He was also at San Sebastian, Bidassoa, Nivelle, bridge on the Adour, and Bayonne. Five years also he served at St. Helena while Napoleon was an exile. |
| " | STEWART CALDER, from royal artillery. Was present at the siege of Cadiz and the actions in the Pyrenees, Bidassoa, Nivelle, Nive, Orthes, Toulouse, and Algiers, where he was wounded. Died at Carlisle October 16, 1822. |

- Date of
Appointment.
- 1812 Mar. 16. **RICHARD TURNER**, served in the Peninsula, including Vittoria and San Sebastian, also at Waterloo. Died at Gibraltar July 16, 1825.
- April 8. **JOHN SPARKS**, served eighteen years in the royal artillery, during which time he was present at Maida, Mount Leon, Scylla Castle (wounded), storming of Alexandria, and wounded at the siege of Rosetta; was also at the bombardment of Scylla in 1808, and capture of Ischia and Procida in 1809. In the sappers he served in the Netherlands and France and at Bermuda. He had two sons, John and Edward, educated at Sandhurst, who received commissions in the army, first as ensigns and afterwards as lieutenants. The former joined the 5th foot, from which he exchanged into the 95th, and afterwards selling out, obtained a majority in the Canadian Militia during the Papineau rebellion. He perished in October 1843, in an attempt to reach the shore from a vessel driven in a storm on the coast near Blackpool. The latter served an honourable career in Scinde, &c., in the 2nd foot, and with a young lieutenant and a military surgeon was, in 1839, while out shooting, burnt to death by the accidental firing of the jungle.
- July 1. **WILLIAM ROBERTSON**, served in Holland in 1799, Hanover in 1805.
- Dec. 1. **CHARLES GRATTON**, commissioned from 3rd foot-guards for his bravery at Burgos. Served in the actions of the 8th and 19th September, and 2nd and 6th October, 1799, in Holland. At the last he was wounded. Also in Hanover; at the passage of the Douro, Talavera, Busaco, Fuentes d'Onoro, Cuidad Rodrigo, Salamanca, and Burgos. In the sappers he was at San Sebastian, Pampeluna, passage of the Adour, and siege of Bayonne, and also in the Netherlands and France. Died at Deptford July 4, 1848.
- [The above officers, with the exception of Lieutenants Palmer, and Booth, retired from the corps on full-pay March 1, 1817.]
- 1813 Feb. 1. **HUGH BAILLIE M'KENZIE**, enlisted into the corps January 17, 1809, was sergeant June 1, 1811, and from that rank received his commission. Talented, energetic and soldierlike, he filled for a time the office of Town Major at Bermuda. After retiring from the corps on full pay in June, 1817, he held for many years the rank of paymaster in the 77th regiment, and subsequently in the 70th, from which he retired on half-pay in March, 1853, and died June 25, 1854.
- Mar. 1. **JAMES A. STEPHENSON**, enlisted June 6, 1809; served in the war in Canada; retired on full-pay December 1, 1817, appointed clerk of works royal engineer department at Fort George, Upper Canada, in June, 1819, and died at Niagara June 11, 1828.
- April 1. **WILLIAM STRATTON**, from royal artillery, in which he had served at Valenciennes, Dunkirk, Lincelles, Lannoi, Cateau, Camp of Caesar, Tournai, and the actions of the 17th, 18th, and 22nd May, 1794, near Lille, also at Nimeguen, where he was wounded. In Turkey he was at Salahieh, Haalbec, and Grand Cairo. After joining the sappers he was at San Sebastian, Nivelle, Nive, bridge on the Adour, Bayonne, and storming of Peronne, where he was wounded severely, and for which he received six months' pay. Retired on full-pay March 1, 1817, and died at Devonport September 27, 1851.

Date of
Appointment

- July 1 **THOMAS ADAMSON**, enlisted in May, 1796, as a drummer, was commissioned from the rank of sergeant, and killed at the storming of Bergen-op Zoom March 8, 1814
- " **WILLIAM KNAPP**, commissioned from a militia regiment, in which he held the rank of lieutenant, and died at Fournay June 17, 1815
- 1814 Jan 14 **EDWARD SANDERS** commissioned from the Cornish militia, in which he was the sergeant major, served in the Netherlands and France. After returning on the 1st March, 1817, on half pay, he went to France and engaged largely in the coach trade. During the revolution which dethroned Charles X the vehicles of Mr Sanders were broken up for barricades, and his horses plundered for the service of the insurgents. His stock in trade was worth about 900*l*, but the wholesale destruction of his property by the rebels, ruined him. Subsequently he earned a scanty living by translating for a printer at Boulogne French works into English, and died in almost abject circumstances in 1851
- Mar 21 **PATRICK JOHNSON**, from royal artillery, in which he served eighteen years. Was in the actions at Antium and Billi, although in 1798, also at Roli, Vimiero, Madrid, Bicivento Astorga, Corunna, two sieges of Badajoz (wounded), Salamanca, Burgos, Vittoria and San Sebastian. In the Spanish service received the thanks of Sir James C. Smyth for bringing up his company by a forced march under peculiar circumstances, from Antwerp to Waterloo on the 16th June, 1815. Retired on half pay March 1, 1817 and died at Stirling Castle September 17, 1833
- " **JAMES ALLEN** from royal artillery, while in that regiment he served with the Turkish army at Salabrich, Braila, Ilimanka, and Girid Cairo. He was also present at Walcheren. In the latter he was at the bombardment of the French fleet at Antwerp in 1814 and served subsequently in Belgium and France. Retired on half pay March 1, 1817 and died at Birnie Canada West January 20, 1864
- 1815 Mar 25 **JOHN ARMSFORD** enlisted July 7, 1800 and served at Copenhagen and Walcheren, was commissioned from the rank of colour sergeant on the recommendation of Colonel Pasley. Retired on half pay March 1, 1817. In April 1819 he fell into the 2nd dragoons, but his previous rank having been his coverd while he was serving as a lance corporal he was discharged in August 1823. Died at Cork December 1, 1831
- April 1 **JOHN HOYLAND** from royal artillery was present in the actions of Aboukir, siege of Aboukir Castle, and battle of Alexandria. Retired on half pay, March 1, 1817
- " 22 **SAMUEL McLEAN**, from royal artillery. Was present at the battle of Corunna and retired on half pay March 1, 1817
- Oct 2 **MICHAEL KNOWLES** from royal artillery. Served at Flushing, two sieges of Imitation, and at Fort St Philip. Retired on half pay March 1, 1817
- Nov 1 **WILLIAM SILVENS** joined as a sergeant from the Royal Cornwall militia. Served at the bombardment of the French fleet at Antwerp and the storming of Bergen-op Zoom in 1814. Was promoted to be colour sergeant for his gallantry at Mexam in entering a magazine under a spirited fire from the enemy. Retired on half pay March 1, 1817, and died at Penzance November 21, 1851

- | <i>Date of
Appointment.</i> | QUARTERMASTERS. |
|---------------------------------|--|
| 1814 Feb. 1. | JAMES GALLOWAY. He discharged the duties of his appointment with singular correctness and efficiency to the end of his days, and died at Belle-vue House, Shooter's Hill, November 9, 1835, aged 65 years. His only son is the senior colonel of the 70th regiment. |
| 1835 Nov. 9. | JAMES HILTON, retired on full-pay January 14, 1848. |
| 1848 Jan. 14. | JENKIN JONES, still serving in the corps. |
| 1853 April 1. | GEORGE ALLAN, commissioned as captain in the Turkish contingent engineers June, 1855. |
| " | WILLIAM YOUNG |
| June 26. | THOMAS CONNOLLY } Still serving in the corps. |
| Dec. 17. | MICHAEL BRADFORD } |

COMMISSIONED INTO OTHER CORPS.

- 1796 May 1. **JOHN JOHNSON,** enlisted March 13, 1788, and attached to the Portsmouth company. Was commissioned in the 29th foot as ensign.
- Oct. **GEORGE ROSS,** enlisted July 31, 1788, and attached to the Gosport company. Was appointed lieutenant in the Carnarvon militia.
- 1799 May 22. **MATTHEW SINGLETON,** enlisted into the corps as sergeant-major, September 10, 1798, and promoted to the 46th regiment as quartermaster.
- 1828 Jan. 24. **THOMAS TOWNSEND,** commissioned as second lieutenant and adjutant of the second battalion 60th regiment. Ultimately he received a captaincy in the same regiment. A few years later he sold out, and is now a barrackmaster in the Ordnance department at Gibraltar.
- 1851 Sept. 23. **EDWARD HILL** possessed very creditable attainments. His duties, either as a clerk or as an overseer, were always executed with diligence and efficiency. Sir William Reid, under whom he was employed at Woolwich, praised him for his exertions and services. Ambitious and enterprising, he accepted the adjutancy of the Gold-Coast corps, and filled, in addition to his regimental offices, the appointments of colonial engineer, and clerk of works in the royal engineer department. In three or four expeditions against neighbouring chiefs, his military acquirements were found of great advantage in directing the formation of camps and the construction of roads and bridges. Once he commanded at Mansu, a body of 12,000 fighting men, gathered from the native tribes in alliance with the British Governor; and, a little later, he had under his orders four field-pieces and an army of 21,000 men, 18,000 of whom bore arms. His head-quarters were at Yancoomassie, and his force—distributed as far as Donguah, with divisions intermediately at Wartett and Donasi—carried out, under his personal orders, the field services necessary to render the movements of the contingents unbecked and successful. The army, intended to bring the king of Ashantee to terms, had the effect of inducing that powerful chief to accept, without a blow, the ultimatum of the Governor. Early in the next year Adjutant Hill was detached to Accra, to defend the Christianburg castle against an armed body of natives who menaced it. With his usual spirit and bravery he set about the work and met his fate on February

Date of
Appointment

22, 1854 (a few days after he was commissioned to be lieutenant), by the explosion of a small powder magazine while he was in the act of firing a gun upon the enemy. His employment in the colony was noticed in honourable terms in 'The Globe' for January, 1853. "Yesterday," wrote Colonel Hill, the Governor, "the service lost a gallant, zealous, and most energetic and useful officer, by the demise of my valued adjutant, to whose memory much praise is due for the very efficient manner he ever performed his onerous duties in this trying climate, and to whom myself and the service are much indebted for his valuable and faithful services." His widow, through the feeling appeal of Colonel Hill, received the Queen's Bounty of 60*l.* a-year; and from the Compassionate Fund, an allowance of 40*l.* a-year for her three infant children.

- 1854 Oct. 6. JOHN JOSEPH GRINLINTON, commissioned as ensign in the 65th regiment, and afterwards removed to the 4th King's Own, with a view to render his sound practical intelligence and experience available in the Crimea. During his short career as an officer he has won golden opinions from his own circle and his commanding officers. Indeed it would seem that his connexion with the ranks has rather helped to increase than diminish his success, and the appreciation evinced for his exertions and efficiency. On his transfer to the 4th foot, his commanding officer officially stated, that his removal would be a loss to the 65th depot. In less than six months after doffing the uniform of a non-commissioned officer, he received promotion as lieutenant, March, 1855; and in allusion to this rise, his former commanding officer, in a congratulatory letter, made this gratifying observation: "I frankly tell you that you carry under your head-piece the makings of a good officer." Subsequently was at the siege of Sebastopol, where, receiving an appointment as assistant engineer, was generally employed on surveying duties, and recommended by Sir Harry Jones for promotion in a dispatch dated 16th September, 1855.
- 1855 June 12. JAMES SIMPSON. Was commissioned as staff-quartermaster to the British Swiss Legion stationed at Dover, and on its disbandment, was removed with the same rank on the 1st October, 1856, to the depot battalion at Stirling.
- " 26. GEORGE ALLAN. From quartermaster; was commissioned as Captain in the Turkish Contingent Engineers.
- July 13. JOSEPH LONGLAND. Commissioned as battalion quartermaster in one of the British foreign legions stationed at Shorncliffe. The duties of his office in connection with the organization of a new force, which were most irksome, shattered his health, and induced him to resign on the following 31st August.
- Dec 1. JAMES FALKNER. From colour-sergeant }
" JOHN LANDREY. From sergeant } to be Cornets, Land
" 16. JAMES SPRY. From colour-sergeant } Transport Corps.
- 1856 Feb. 4. WILLIAM LAMBERT. From colour-sergeant to be quartermaster Land Transport Corps.
- " 9. GEORGE WOHLMANN. From colour-sergeant } to be Cornets, Land
" 9. CORNELIUS GODFREY. From colour-sergeant } Transport Corps.
[The sergeants appointed to the Land Transport Corps had all served at the siege of Sebastopol.]

APPENDIX V.

- SERGEANT-MAJORS.
- Date of Appointment.
- 1772 May 22. **THOMAS BRIDGES.** See note, p. 5, vol. i.
- 1781 Sept. 29. **HENRY INCE.** See p. 31, vol. i.
- 1787 Oct. **JOHN DREW.** See note, p. 68, vol. i.
- Nov. 1. **JOHN SIPPLE,** a native of Hesse-Cassel, born in 1740, joined from the royal artillery and was attached to the Portsmouth company. In June, 1791, he was transferred to the invalid artillery.
- „ 4. **CHARLES PALMER,** from royal artillery as sergeant-major; was attached to the Chatham Company, and commissioned as Sub-Lieutenant December 1, 1806.
- „ 19. **ALEXANDER SPENCE.** See note, p. 68, vol. i.
- „ **JOHN HOPKINS,** joined the Plymouth company as sergeant-major, and died there March 1, 1788.
- 1788 Mar. 2. **WILLIAM BROWNE,** enlisted into the royal artillery in 1770, in which he became a sergeant-major in 1783. With that rank he joined the Plymouth company, and was commissioned as Sub-Lieutenant December 1, 1806.
- „ **ANTHONY HAIG,** enlisted as a matross, in 1770, into the royal artillery. Served in Canada from May, 1773, to November, 1787, and was at the siege of Quebec, where he was wounded, and favourably mentioned for his gallant conduct in general orders by Lord Dorchester. In 1788 he joined the Guernsey half company, and in 1795 was highly complimented by General Small for his efficient services in training and drilling the royal Guernsey cavalry. On December 1, 1806, he was commissioned to be Sub-Lieutenant.
- 1791 June 1. **JAMES SMITH,** after a service of twenty-four years was transferred from the royal artillery, as sergeant-major, and attached to the Portsmouth company, in which he was made Sub-Lieutenant December 1, 1806.
- Nov. **CHARLES MILLAR,** enlisted in March, 1778, in the royal artillery, and served at the siege of Gibraltar. Was transferred to the corps, as a corporal, in July, 1788, and became sergeant-major of the Jersey half company. In October, 1797, he was discharged and appointed overseer in the department at Jersey, in which situation he continued until May 1809, when he was made a Sub-Lieutenant.
- „ **JOSEPH CHAMBERS.** See note, p. 20, vol. i.
- 1793 Nov. **JOHN FINLAY,** enlisted July, 1788, and accompanied the expedition to Holland as sergeant-major. On December 24, 1794, he was reduced to a private, and on his return from Flanders was sent to the West Indies, and died April 20, 1797, on board the 'Orpheus' transport.
- 1794 Jan. 1. **MATTHEW HOEY.** See note, p. 90, vol. i.
- 1795 Jan. **ANDREW GRAY,** in 1793 accompanied the expedition to Holland, and served in the campaigns of the Duke of York until 1795. He succeeded to the sergeant-majorcy of the Flanders company on the reduction of John Finlay, and was promoted in December 19, 1801, to the corps of surveyors and draughtsmen.
- May 11. **THOMAS FORTUNE.** See note, p. 117, vol. i.
- 1796 Dec. 1. **JOSEPH MAKIN** joined the royal artillery December 30, 1768; from the second battalion of which, he was transferred to the corps at Gibraltar May 21, 1774, and served at the siege of that fortress. In July, 1804, he was superannuated.

- Date of Appointment.
- 1799 May 15 JOHN FAYES, was a native of Brumen, in Hanover, and enlisted October 15, 1773, as a drummer in the royal artillery. His promotions were, first gunner, August 1, 1779, bombardier, August 1, 1781, corporal July 1, 1791, and sergeant November 1, 1793. His active services were at Goret, from 1779 to 1781, Gibraltar, July, 1783 to November, 1785, West Indies, from December 1785, to May, 1790 and the campaigns in Holland, from February, 1793 to May, 1795. He joined the corps as sergeant major and from his fine soldierlike appearance, experience, and knowledge of drill was retained for duty at Woolwich and, sometimes, during the absence of the adjutant, carried on the duties of the chief executive of the corps. Became Sub Lieutenant December 2, 1806.
- 1800 May 2 JAMES SHIRRES See notes, pp 35, 120, vol 1
- 1802 April MATTHEW PRIDEAUX appointed to the half company at Guernsey, where he died November 6, 1803
- 1803 Mar 1 EDWARD WATSON See notes pp 123, 13 vol 1
Nov 1 DAVID FAICOMER became Sub Lieutenant in June, 1807. The whole of his service was passed at Gibraltar
- 1804 Oct 5 JOHN LIVING joined as an artificer from the artillery in April, 1791. Was sergeant major of the company at Spike Island, where he died April 22, 1805
- 1805 Oct 8 WILLIAM BISHOP joined the corps as a sergeant from the artillery in October 1805, when he was attached to the Spike Island company from which he was pensioned at 2s 1d a day, on December 31 1814
- 1807 Jan 1 ROBERT WAKEMAN enlisted into the corps April 2 1789, and on May 1 1789 was promoted to be sergeant. Four years he served as sergeant major of the company at Plymouth, and died there April 15, 1811
12 JOHN CUTTING had been two years in the 46th regiment, and enlisted into the royal military artificers, January 8 1807. Many years of his service were spent at Lambidge in a crumbing for the corps. In March 1821 he was appointed quartermaster sergeant, and in February, 1824, pensioned at 3s 6d a day
- Mar 2 GEORGE ROBINSON from the artillery as sergeant major, and commissioned as Sub Lieutenant November, 1807
- July 1 THOMAS LONGSHAW, enlisted July 13, 1793. For many years he served in Halifax Nova Scotia, and was an able mechanic and assiduous foreman. He became a Sub Lieutenant in June, 1811
- Aug 1 ALEXANDER MINRO was five years in the royal artillery and transferred to the corps August 1 1803. In January 1805 he was promoted to be corporal and in June 1806 to be sergeant. He was a man of considerable ingenuity and talent, and for his services and useful inventions was made sergeant major. On the formation of the establishment for field instruction at Chatham he was removed there to assist the director and was commissioned as Sub Lieutenant in June, 1811. See note, p 166 vol 1
- 1 JOSEPH FORBES enlisted in the corps August 7, 1779, was promoted to be corporal March 1 1803 and sergeant March 1, 1805. Being a skilful mason his efficiency on the works frequently gained him the praise of his officers. From sergeant major of the Dover company he was selected, on account of his

Date of
Appointment

- attainments, to accompany the expedition to Walcheren, and, after serving at the siege of Flushing, died at Middleburgh, September 17, 1809
- Oct 1 RICHARD TURNER, enlisted November 17, 1798, and gained the rank of sergeant in February, 1806. Most of his service was spent at Gibraltar. Became Sub-Lieutenant in March, 1812
- 1808 Jan. 1 JAMES GALLOWAY, joined from royal artillery. Enlisted in February, 1790, and served in Holland in 1799. The excellence of his conduct, and his imposing soldierlike appearance, won him the appointment of regimental sergeant-major. His efficiency in the office was quite a feature in his day, and in the absence of the adjutant he carried on the official business of the corps by corresponding with the commanding officers at the different stations. He was promoted to be quartermaster February 1, 1814
- Dec 1 JOHN BLACK, enlisted July 24, 1790. Was sergeant-major to the Guernsey half company. At the close of the war was appointed quartermaster sergeant.
- 1809 April 3 ALEXANDER ROSS, enlisted January 7, 1789. Was both a carpenter and mason, and a valuable foreman. Was removed from Guernsey to be sergeant-major to the Portsmouth company. On the 15th October, 1808, he was discharged and appointed overseer of works in the royal engineer department, but his military knowledge and attainments again brought him into the corps in June, 1811, with the rank of Sub-Lieutenant
- July 10 JOHN SMITH, from royal artillery, as corporal, December 31, 1807, in which he had served ten years, and was wounded in action near the Seven Churches, county of Wicklow, in June, 1798. After his promotion to be sergeant-major he was attached to the Walcheren expedition, and was present at the siege of Flushing. In June, 1811, he was made a Sub-Lieutenant
- 1811 Jan 1 JOHN DUNBAR, enlisted March 23, 1793, and in June, 1811, was commissioned as Sub-Lieutenant
- " PATRICK WHIFLAN, joined from the 68th foot in June, 1803, as a corporal, and, serving many years with the corps in the West Indies, was present in many actions and captures. In June, 1811, he became a Sub-Lieutenant
- " ROBERT GIBB, enlisted March 1, 1804, and in June, 1811, received a Sub-Lieutenancy
- June 1 GEORGE POPE, enlisted December 1, 1791. Served most of his time on the works at Portsmouth. Was present at Oporto and Talavera in 1809. On his return from the Peninsula was promoted to be sergeant-major. In February, 1819, he was pensioned at 2s 3d a day, and died at Woolwich in December, 1848
- 1812 May 1 THOMAS HOUNSLOW, served at Flushing, Cadix, and Birrosa. For his efficiency and zeal, Colonel Lord, royal engineers, presented him with an elegant sword. Pensioned at 2s a-day in March, 1817, he went to Canada and obtained the appointment of foreman in the royal engineer department. About 1848 he died in London. A son of his, during the Papineau rebellion in Canada, was lieutenant and adjutant in the Beauharnois Loyal Volunteers. He did good service during the outbreak, and was taken prisoner by the rebels in November, 1848. He is now clerk of works in the royal engineer department at the Ministry.

- Date of Appointment.
- 1815 April 1. JOHN CRAIG, died at Woolwich September 15, 1815.
- Oct. 23. JAMES DOUGLAS, enlisted September 1, 1806. Was second-corporal September 2, 1810; corporal, February 1, 1811; sergeant, August 1, 1812. Served at Roleia, Vimiera, Torres Vedras, Ciudad Rodrigo, Badajoz, Vittoria, San Sebastian, Bidassoa, Nivelle, Nive, Orthes, Toulouse, and Waterloo, besides in numerous lesser affairs. He was an excellent artificer and a brave soldier. In moments of danger his presence of mind and facility of resource and invention made his services valuable. He died at Woolwich November 9, 1827.
- 1821 Mar. 1. THOMAS TOWNREND, enlisted May 6, 1812. Was second-corporal, February 1, 1813; corporal, December 9, 1813; sergeant, August 12, 1814; and colour-sergeant April 1, 1816. Served a station at Gibraltar. Was a very fine soldier and a successful drill-master. For seven years he was the regimental sergeant-major at Chatham, and was commissioned as Second-Lieutenant and Adjutant in the 60th rifles in January 1828.
- 1827 Nov. 10. JAMES HILTON, served with credit in Holland in 1813 and 1814, and in the Netherlands and France to 1818. Was sergeant-major of the corps in France, and afterwards at Woolwich. Became quartermaster in 1835.
- 1828 Feb. 1. JENKIN JONES, served a station at Barbadoes, and many years at the royal engineer establishment at Chatham. Was always an indefatigable and enterprising non-commissioned officer, and no man in the corps, perhaps, has been subjected to, and escaped without hurt, so many dangers. The innumerable experiments in mining, blasting, sapping, and the varied applications of gunpowder at the establishment in which he was engaged, were frequently not only attended with great hazard but accident. His particular services have been mentioned in the memoir. In 1848 he was appointed quartermaster to the corps.
- 1835 Nov. 10. JAMES FORBES, mentioned in the Memoir. Retired from the corps on a pension of 2s. 4d. a-day, in April, 1843, having received an appointment on the Trent and Mersey Canal.
- 1843 Apr. 12. GEORGE ALLAN, served a station at Gibraltar. Was a very successful drill-master. His promotion as sergeant-major took him to Chatham, where his exertions and experience were of advantage in the practical education of the men in the field duties of the corps. As a reward for his services he received the commission of quartermaster to the royal engineer establishment, and in June, 1855, became a Captain in the Turkish Contingent Engineers.
- 1846 Feb. 1. MICHAEL BRADFORD Promoted to be quartermaster in December, 1855.
- 1853 Apr. 1. WILLIAM READ, serving at Chatham.
- 1854 Aug. 1. JOHN J. GRINLINTON, in the space of ten years became sergeant-major of the survey companies. Well educated, clear-headed, and accurate, he was intrusted with duties of great responsibility. For several years he annually disbursed about 24,000*l.* on the public service; and such was his physical activity and mental strength, that no amount of labour seemed to tire or weaken his energies. In the absence of his officers on particular duty, he acted with intelligence, decision, and firmness in emergencies and difficult cases. It was these capa-

Date of
Appointment.

bilities, coupled with his gentlemanly manners, address, and deportment, that induced Colonel Hall, the superintendent of the ordnance survey, to bring forward his merits, to obtain for him a commission in the line. In this he succeeded. The Colonel stated, in his official recommendation of sergeant-major Grinlinton, that his ability could be turned to good account in a regiment by instructing young officers in the mode of sketching ground, describing localities and positions, and in various other staff duties essential for the movements of an army across a country. Being a good surveyor and draughtsman, and possessed of attainments to render him successful in services of reconnaissance, he was regarded as specially adapted for a post in the Quartermaster-General or Adjutant-General's department of the army. In October, 1854, he was commissioned as ensign in the 65th regiment; and a few officers, under whom he had served, presented him with a purse of forty sovereigns, accompanied by a letter full of expressions of eulogy and esteem.

- Oct. 6. JAMES STEEL, serving on the ordnance survey at Southampton.
1856 Jan. 1. JOHN JONES, serving in Chatham.
JOHN POOLE, serving at Chatham. Has been in Canada, Cape of Good Hope, Turkey, and the Crimea. Was mentioned in a dispatch for distinguished conduct in an affair near Grass Kop Tower in February, 1851, under Ensign Gill, cape mounted rifles. Was at the formation of the lines of Boulair, and those on Inkermann heights after the battle of the 5th November, 1854. For a period he was the sergeant-major of the corps at the siege of Sebastopol.

QUARTERMASTER-SERGEANTS.

- 1811 June 1. FRANCIS ALLEN, enlisted July 6, 1793. Was present at the siege of Flushing. Most of his time was spent at Chatham. Pensioned in 1833. See note, p. 290, vol. i.
" GEORGE HARDIE, after thirty years' service, was discharged in March, 1817, on a pension of 2s. 4d a-day.
1814 July 1. JOSEPH PAUL, gained his several steps of promotion with great rapidity, and died after seven years' service, at Truro, in May, 1815.
1815 June 1. GEORGE HAY, served thirteen years in the corps, and died at Woolwich, in November, 1820.
" JOHN BLACK, after a service of twenty-eight years was discharged in February, 1819, and died some years after at Chatham.
1821 Mar. 1. JOHN CUTTERIDGE, on his removal from the recruiting service at Cambridge was found to be about 900*l.* in debt. Aberration of mind followed the discovery, and he was pensioned in February, 1824, at 3s. 6d. a-day.
1824 Mar. 1. WILLIAM PARKER, was a man of varied information and a clever clerk. After twenty-five years' service he was discharged in September, 1829.
1829 Oct. 1. BRITTON FRANCIS, was an able clerk, served many years at Gibraltar, and received much credit for his abilities and efficiency. Six years he filled the office of quartermaster-sergeant at Woolwich, and was discharged in October, 1835. He died at Newport, in 1851.

- Date of Appointment.
- 1835 Oct. 14. JOHN BENNETT was discharged in January, 1843, after twenty-eight years' service. See note, p. 257, vol. i.
- 1841 Aug. 1. THOMAS FRASER, was discharged in July, 1849, and retired as a farmer to Kinlochunagan, Inverness. See note, p. 379, vol. i.
- 1843 Jan. 11. ROBERT SHORTER, was discharged in January, 1850, and is now a yeoman of the Queen's guard. See note, p. 262, vol. i.
- 1849 July 11. WILLIAM RALPH, served at the Cape of Good Hope and Gibraltar for fourteen years. Was an active and intelligent non-commissioned officer. He was removed from Gibraltar, where he held the office of acting sergeant-major, to Chatham, on promotion, and was presented by the non-commissioned officers of the corps at that fortress with a silver snuff box as a tribute of esteem for his character and impartiality. Discharged in May, 1854.
- 1850 Jan. 9. THOMAS CONNOLLY, who was commissioned to the rank of quartermaster in June 1855.
- 1854 May 16. SAMUEL MARCHE, serving at Chatham.
- Aug. 1. JAMES STEEL, promoted to be sergeant-major, October, 1854.
- Oct. 6. JAMES SIMPSON. Most of his military career was passed on the national surveys, and in appreciation of his rectitude, intelligence and activity, was promoted to the rank of staff-sergeant. When the foreign battalions were being organized, he was presented with a staff-quartermastery in the British Swiss Legion in June, 1855.
- 1855 June 26. NOAH DEARY, served at Woolwich, and was discharged on receiving the appointment of foreman of works in the royal engineer department at the Cape of Good Hope.
- July 1. BENJAMIN K'EN SPENCER, serving at Southampton.
- 1856 Jan. 1. HENRY BROWN, serving at Chatham.

BUGLE-MAJORS.

- 1811 June 1. JAMES BAILEY, enlisted August 1, 1797. Served in Holland in 1799. Was first drum-major, and a few years after was appointed bugle-major. In July, 1835, he was discharged and died at Guernsey, about 1849.
- 1835 July 8. DAVID YOUNG, serving at Chatham.

STAFF-SERGEANTS.

- 1855 Oct. 9. JAMES RAINEY MUTCH, chief clerk to the Assistant Adjutant-General. See Appendix vii.
- " JOHN JONES, chief clerk and draughtsman to the director of the royal engineer establishment. Served five years at Corfu, and while with the Baltic fleet was present at the capture of the Aland Islands and destruction of Bomarsund. Promoted to be sergeant-major, January, 1856.
- 1856 Jan. 1. RICHARD LEXONARD, succeeded the former on promotion. Served nearly eight years at Gibraltar, where he was the chief military clerk under the commanding royal engineer. So well did he discharge his duties that Colonel Rice Jones—a most particular officer—treated him with unlimited confidence.

Though the title of staff-sergeant is general in the service for all grades above that of colour-sergeant, the designation is employed as a specific rank for the two senior clerks of the corps.

APPENDIX VI.

ANNUITIES AND MEDALS TO STAFF-SERGEANTS AND SERGEANTS for distinguished or meritorious Services.

Annuities.			
1846.		£.	
Jan. 1.	Sergeant-major JENKIN JONES	20	{ Was distinguished in the discharge of his duties in the West Indies, and at Chatham and Woolwich. Relinquished the annuity on being commissioned to the rank of quartermaster in the corps.
"	Quartermaster-sergeant ROBERT SHORTER. . . .	10	{ For zealous and efficient services both at home and abroad. Was fourteen years at Corfu.
"	Colour-sergeant JAMES YOUNG	10	{ For distinguished conduct in action with the Boers at Natal, and for highly efficient services and coolness in the defence of the position during its protracted siege by the Boers.
"	Colour-sergeant WM. BLACK .	10	{ For devoted services at Corfu, Gibraltar, and Halifax, N.S.; and particularly so on the Euphrates expedition and in the Syrian campaign. Was present at the taking of Beyrout and Acre.
1848.			
Jan. 14.	Colour-sergeant WM. YOUNG .	10	{ For valuable services in connexion with the varied calculations pursued on the ordnance survey. Relinquished the annuity on being commissioned to the rank of quartermaster.
1848.			
Jan. 14.	Sergeant THOMAS CONNOLLY .	10	{ For service in the brigade-major's office at headquarters.
1833.			
April 1.	Colour-sergeant WM. CAMPBELL	10	{ For distinguished services in prosecuting the ordnance surveys of Great Britain and Ireland.
"	Bagle-major DAVID YOULE .	10	{ For long service, well-directed zeal in the discharge of his duties, and proficiency in conducting the band.
1855.			
April 1.	Sergeant-major MICH. BRADFORD	10	{ For constant zeal and uniform efficiency in his duties. Served several years at Gibraltar. Relinquished the annuity on being commissioned to be quartermaster.

		Annuities.	
		£	
June 26.	Colour-sergeant HENRY BROWN	10	{ For highly useful services at Gibraltar, in Syria, the Aland Islands, and Crimea. Was at the taking of Tyre, Sidon, and Beirut, the destruction of Bomarsund, and siege of Sebastopol.
Dec. 17.	Colour-sergeant JAMES DONELAN	10	{ For unimpeachable accuracy in observing with the three-foot instrument for the great triangulation of the United Kingdom—a duty to which he attended for many years under strange vicissitudes and difficulties.
1856. April 1.	Colour-sergeant HEN. McDONALD	20	{ For conspicuous bravery in the capture of the rifle-pits, 19th April 1855, during which he was severely wounded. Served at Gibraltar, in Turkey, Bulgaria, and the Crimea. Was at the battles of Alma and Inkermann, and siege of Sebastopol.

APPENDIX VII.

REWARDS to NON-COMMISSIONED OFFICERS and SOLDIERS of the CORPS, from public or private sources, for particularly commendable services.

- 1831 Second-corporal HENRY SRAFIELD. From Royal Humane Society. A reward of 2*l.* for endeavouring to rescue from drowning, five boys who had fallen into the Mulgrave Reservoir at Woolwich. For his spirited and humane conduct on this occasion, he was also promoted to be second-corporal.
- 1833 Sergeant JAMES FORBEN. From the Governor, Royal Military College, Sandhurst. A case of mathematical drawing instruments, "for his intelligence, zeal, and good conduct, in charge of the detachment employed in the field-work instruction at the college for four years."
- 1835 Private JOHN DOWN. From his officers at Chatham. A hold-all, containing a silver knife, fork, and spoon, and useful toilet articles, with an appropriate inscription on a silver plate, "for his gallant conduct in rescuing a comrade, private Thomas Adams, from drowning."
- 1835 Sergeant-major JAMES HILTON. From the officers of royal engineers at Woolwich. A purse of 20 sovereigns, and a regimental sword, suitably inscribed, on his promotion to the rank of quartermaster, as a token of their esteem for his services.
- 1837 Sergeant HUGH LANTON. From the Governor of the Royal Military College, Sandhurst. A case of mathematical drawing instruments, "for the intelligence, zeal, and uniform good conduct evinced by him in charge of the detachment employed in field-work instruction at the college."

- 1838 Sergeant-major JENKIN JONES. By the sergeants of Chatham garrison. A silver tankard, "in testimony of their gratitude for the undeviating attention evinced by him while superintending the formation of a military swimming-bath."
- 1838 Second-corporal WILLIAM CAMPBELL. By the Commissioners of Education in Ireland. A case of mathematical drawing instruments, "in testimony of the intelligence and ability he displayed in teaching surveying and levelling to the inspectors of national schools."
- 1838 Corporals WILLIAM SPREY and WILLIAM RICHARDSON. Gold medals from Sultan Mahmoud II. for service in Constantinople from 1836 to 1838.
- 1841 Private HENRY ENTWISTLE. From the Royal Humane Society. A silver medallion and vellum certificate for courage and humanity, during the pontoon practice on the 30th August, 1841, in plunging into the river Medway, near Rochester Bridge, and at imminent personal risk, rescuing from drowning private Samuel Turner of the corps, who had accidentally fallen overboard, and was unable to swim. Became a sergeant, and died before Sebastopol, 29th November, 1854.
- 1842 Sergeant-major JENKIN JONES. By the Corporation of the Trinity House. A gold snuff-box "to commemorate the assistance he rendered in the destruction of two wrecks in Sea Reach, by submarine explosions."
- 1843 Corporal JAMES HENRY DREW. By the Society of Teetotallers. A silver medallion with gold lozenge-shaped coat-of-arms in centre, "as a token of respect for his talented lecture on the principles of total abstinence and Rechabitisim, as well as for valuable services as local secretary at Chatham in promoting the cause." Died from wounds received at the siege of Sebastopol, 22nd November, 1854.
- 1845 Private PATRICK J. HOGAN. From H. R. H. Prince Albert. A present of 5*l.* in admiration of his talents as an artist, as displayed in a beautiful etching of the Victoria Oak, in the Green Park at Windsor. He had previously received the high honour of an audience with the Prince Consort on his presenting to H. R. H. an etching of the Adelaide Oak in the Home Park.
- 1845 Privates PATRICK J. HOGAN and CHARLES HOLLAND. From H. R. H. Prince Albert. Each a case of mathematical drawing instruments, "as a mark of his approbation for merit in the execution of a survey and drawing of Windsor and its vicinity."
- 1847 Corporal JOHN RAE. From the Governor of the Royal Military College, Sandhurst. A case of mathematical drawing instruments, "for intelligence, zeal, and uniform good conduct in charge of the detachment employed in field-work instruction at the college." Is now staff-sergeant at the college.
- 1847 Sergeant JAMES RAINEY MUTCH. By the members of the Woolwich Literary and Scientific Institution. A silver snuff-box "for his valuable and successful services as secretary to the Institution." This non-commissioned officer was chief clerk in the Assistant-Adjutant-General's office at Chatham. His attainments are of a character to make his services very efficient and satisfactory. Having studied in King's College, Aberdeen, where he graduated M.A., he has a fair knowledge of Greek and Latin, and is well grounded in mathematics. For many years, apart from his military duties, he held the office of secretary to the Woolwich Institution; and to his perseverance and untiring advocacy, it was mainly indebted for continuing so long in ex-

istence. When it passed from under his superintendence into other hands, it gradually lost energy and vitality, and, in time, uniting itself to a local speculation, fell to pieces with the insolvency of its new alliance. It should also be mentioned, to his credit, that sergeant Mutch had the honour of originating in Woolwich the movement in favour of the Great Exhibition. By consulting a few leading men, the project received the countenance it merited, and eventually, a meeting to extend the object, the largest demonstration ever known in Woolwich, was held in the riding-school, under the auspices of Lieutenant-General Sir Thomas Downman, who presided on the occasion.

- 1847 Private **JAMES PEAT**. Bronze medallion, from the Royal Humane Society, for prompt and intrepid conduct in assisting to rescue from drowning, two gunners of the royal artillery, who had sunk while bathing in St. Mary's Creek. Private Peat was pontooning at the time.
- 1849 Privates **WILLIAM THOMAS, DANIEL JONES, and JAMES CRAY**. Bronze medallion each, from the Royal Humane Society, "for their noble courage and humanity in endeavouring to rescue from drowning their comrade, private Joseph Cox, who had fallen into the river Medway, on the 26th April, 1849." The first private, on a previous occasion, had jumped into the Medway after a civilian, and brought the body ashore too late for resuscitation.
- 1850 Private **ROBERT McDONALD**. A handsomely-bound Polyglot Bible, from the teachers and children of the village of Elrig, Mochrum, "in token of his Christian benevolence in founding the Sabbath school at Elrig, and conducting it with unwearied labour and at much sacrifice of his limited means and time to its present flourishing condition." The Bible was presented at a soiree, and Mr. Routledge, on the part of the meeting, "expressed the gratitude felt to private McDonald for having reclaimed so many poor children, and brought them together for a purpose so calculated to promote their interests."
- 1851 Colour-sergeant **JOHN CARLIN**. Gold pen and engineering pencil-case, from Lord Frederick Fitzclarence, "for showing himself exceedingly clever in calculations of a rather puzzling nature, and being a most zealous, active, and painstaking non-commissioned officer."
- 1852 Sergeant **HENRY QUODLING**. By a number of civilians at York. A case of professional instruments, "as a token of their affectionate regard on his leaving England for Van Diemen's Land." It was presented to him at a dinner provided by the subscribers; "and it must," writes the 'Yorkshire Gazette', of June 12, 1852, "be highly gratifying to the members of the corps connected with the ordnance survey in the city, to find that their general conduct has been such, as to win for them the respect of the citizens of York."
- 1854 Sergeant **BENJAMIN CASTLEDINE**. From the Governor of the Royal Military College, Sandhurst. A case of mathematical drawing instruments, "for intelligence, zeal, and uniform good conduct in charge of the detachment employed in the field-work instruction at the college."
- 1855 Quartermaster **MICHAEL BRADYORD**. From the non-commissioned officers of the corps at Woolwich. An elegant double-handled silver goblet, "as a mark of regard and esteem."
- 1855 Sergeant-major **JAMES STEEL** and Quartermaster-sergeant **B. KEEN SPENCER**. Each a present of 10*l.* from Prince Albert, "as a mark of H.R.H.'s approval of their attention and care in making the survey of Osborne."

- 1856 Quartermaster **MICHAEL BRADFORD**. From Captains Theodosius Webb, G. Ross, F. E. Cox, Fitzroy Somerset, and Lieutenant G. R. Lempriere, R.E. A regimental sword, "as a mark of their regard and esteem for his character and conduct." He was the sergeant-major at head-quarters, while the officers who made the presentation successively filled the appointment of Acting Adjutant.
- 1856 Staff-sergeant **JAMES RAINEY MUTCH**. From "inhabitants of Woolwich." A neat silver tea-service of three pieces, "in grateful acknowledgment of the eminent services he has rendered to the Literary and Scientific Institution, the Mutual Benefit Building Society, and other associations, having for their object the benefit of the community." The service was handed to sergeant Mutch by Richard Pidcock, Esq., the churchwarden, at a public meeting of the subscribers. Mr. Mutch has since been promoted to be Quartermaster in the Corps.
- 1856 Corporal **JAMES FRANKHAM CHURCH**. From the Royal Geographical Society of London. A silver watch and appendages, by Frodsham, in appreciation of "his meritorious and intelligent services on the Central African Expedition, 1853-54-55." The testimonial was presented to him by the President, Admiral Beechey, and Sir John Burgoyne did the corporal the honour of replying to the observations of the Admiral, and thanking the society for the gift.

APPENDIX VIII.

REWARDS to NON-COMMISSIONED OFFICERS and MEN of the CORPS, for Services at the Great Exhibition of 1851 under the Royal Commissions.

Each man received a bronze medal, a certificate signed by Prince Albert, and a present, according to the value stated against the respective classes.

1st CLASS.

Presents value 10*l.* each.—No. 13.

Colour-sergeant	THOMAS HARDING	Acting sergeant-major, and general superintendent.	} Gold watch each.
Ditto	NOAH DEARY	In charge, foreign side.	
Sergeant	WILLIAM JAMIESON	In charge, British side.	
Corporal	ARCHIBALD GARDNER	Clerk and draftsman	} Silver watch, box of instruments, and writing-case.
Second-corporal	WILLIAM DICKSON	Clerk and draftsman	
Ditto	JOHN VERCOE	Clerk, charge of stationery, &c.	} Gold watch each.
Ditto	WEST T. BIRMINGHAM	Clerk and draftsman	
Lance-corporal	JAMES MACK	Clerk and draftsman	} Box of instruments and colours, and writing-case.
			} Gold watch

Lance-corporal	JOSEPH BARROW . .	Testing fitments, draftsman, &c.	{ Silver watch and box of instruments.
Ditto . .	ROBERT FLEMING . .	Testing girders, columns, &c.	{ Gold watch each.
Ditto . .	RICHARD RICE LINDSAY	Clerk and draftsman	
Ditto . .	JOHN PENDEBED . .	Clerk, autographer, &c.	
Private . .	GEORGE CAMPBELL . .	Clerk and draftsman	{ Silver watch, box of instruments & box of colours.

2ND CLASS.

Presents value 5*l.* each.—No. 41.

Sergeant . .	JAMES HENRY PRANCE . .	{ Box of instruments each.
Lance-corporal	JOHN FLUDE	
Private . .	HENRY HUNT SMITH . .	
Ditto . .	JAMES WILLIAM NEWTON .	
Corporal . .	JAMES STEIN	{ Silver watch each.
Ditto . .	GEORGE JARVIS	
Ditto . .	THOMAS DUMVILL	
Ditto . .	WILLIAM BOBINSON . . .	
Ditto . .	WILLIAM FRASER	
Ditto . .	GEORGE MOORE	
Ditto . .	JOHN MCQUILLAN	
Second-corporal	JOHN KENDRICK	
Ditto . .	ROBERT SHEARN	
Ditto . .	AARON CROUT	
Ditto . .	WILLIAM KING	
Ditto . .	GEORGE LANDRIN	
Ditto . .	NICHOLAS MARSHALL . .	
Lance-corporal	THOMAS HANNS	
Ditto . .	THOMAS WM. NOON . . .	
Ditto . .	CHARLES WM. FEAR . . .	
Ditto . .	NICHOLAS CLABBY . . .	
Ditto . .	MICHAEL KELLY	
Ditto . .	HENRY JARVIS	
Ditto . .	WILLIAM BARNARD . . .	
Ditto . .	THOMAS JANE	
Ditto . .	GEORGE GALL	
Ditto . .	JAMES MILES	
Ditto . .	DAVID MITCHELL	
Ditto . .	JAMES J. GEORGE	
Ditto . .	THOMAS BAKER	
Ditto . .	ROBERT DOW	
Ditto . .	JOHN VENNER	
Ditto . .	JAMES WRIGHT	
Ditto . .	THOMAS PIKE	
Ditto . .	CHARLES J. MORTIMER .	
Ditto . .	GEORGE PEARSON	
Ditto . .	JOHN FERGUSON	
Ditto . .	JOHN ROSE	
Private . .	JAMES H. MURRAY . . .	
Ditto . .	ANDREW ANDERSON . . .	
Ditto . .	JOHN SMITH	

3RD CLASS.

Presents value 3*l.* each.—No. 41.

Lance-corporal	WILLIAM TAYLOR . . .	} Box of instruments each.
Ditto . . .	THOMAS BENNETT . . .	
Sergeant . . .	JACOB CAVILL . . .	} Silver watch each.
Ditto . . .	JOHN SPENCER . . .	
Ditto . . .	THOMAS P. COOK . . .	
Second-corporal	WILLIAM WILSON . . .	
Lance-corporal	WILLIAM CHAMBERS . . .	
Ditto . . .	WILLIAM STRACHAN . . .	
Ditto . . .	WILLIAM THOMAS . . .	
Ditto . . .	JAMES HART . . .	
Ditto . . .	JOSEPH GARTSHORE . . .	
Ditto . . .	WILLIAM JAMES . . .	
Ditto . . .	JOHN ANCELL . . .	
Ditto . . .	RICHARD J. LETTON . . .	
Ditto . . .	JAMES CURGENVEN . . .	
Ditto . . .	WILLIAM STEWART . . .	
Private . . .	EDWARD GILL . . .	
Ditto . . .	WILLIAM JOSE . . .	
Ditto . . .	THOMAS HAY . . .	
Ditto . . .	JOHN DOUST . . .	
Ditto . . .	JAMES B. MILLER . . .	
Ditto . . .	WILLIAM MADDICK . . .	
Ditto . . .	WILLIAM WEBB . . .	
Ditto . . .	JOHN RAE . . .	
Ditto . . .	SERVETUS BISHAM . . .	
Ditto . . .	JAMES CRAIG . . .	
Ditto . . .	ALEXANDER DUNLOP . . .	
Ditto . . .	SAMUEL HARDING . . .	
Ditto . . .	WILLIAM H. HAYMAN . . .	
Ditto . . .	JAMES KELLY . . .	
Ditto . . .	JOHN LINFORD . . .	
Ditto . . .	LEWIS MILLER . . .	
Ditto . . .	JAMES MCADAM . . .	
Ditto . . .	CHARLES NOBBS . . .	
Ditto . . .	THOMAS PATERSON . . .	
Ditto . . .	GEORGE BARTLETT . . .	
Ditto . . .	WILLIAM FERGUSON . . .	
Ditto . . .	CHARLES REEVES . . .	
Ditto . . .	THOMAS THOMAS . . .	
Ditto . . .	LAWRENCE BOWERS . . .	
Ditto . . .	ROBERT ROBERTSON . . .	

4TH CLASS.

Presents value 1*l.* each.—No. 97.

Corporal . . .	EDWARD TAYLOR . . .	} Box of instruments each.
Lance-corporal	FRANCIS IRWIN . . .	
Ditto . . .	WILLIAM SIMPSON . . .	
Private . . .	ALFRED ANDREWS . . .	
Ditto . . .	RICHARD BRIDGMAN . . .	
Ditto . . .	CHRISTOPHER BROWN . . .	
Ditto . . .	MARK DAY . . .	
Ditto . . .	GEORGE FRASER . . .	

Private	GEORGE L. LAW	} Box of instruments each
Ditto	FARQUHAR MCRAE	
Ditto	RICHARD NEWCOMBE	
Ditto	JOHN PHEASANT	
Ditto	JOHN STEWART	
Ditto	WILLIAM TURNER	
Ditto	ALEXANDER COOK	
Ditto	WILLIAM CHAPMAN	
Ditto	GEORGE FARRAR	
Ditto	CHARLES BURTON	
Ditto	MATTHEW BOWLING	
Ditto	ALEXANDER DOUGLAS	
Ditto	WILLIAM KELLY	
Ditto	BENJAMIN MANN	
Ditto	ADAM McKECHNIE	
Ditto	JAMES PFACOCK	
Ditto	JOHN SMITH	
Ditto	ALFRED SPENCER	
Ditto	WILLIAM HILTON	
Hugler	EDWARD CHARLES DEAN	
Ditto	JOSEPH LYNDBALL	
Private	THOMAS EVANS	} Case of instruments and pen-knife each
Ditto	EDWIN L. GWYTHIR	
Corporal	WILLIAM HUTCHINS	}
Ditto	WILLIAM THREPLAND	
Second corporal	WILLIAM WAKFIELD	
Ditto	WILLIAM MILLIN	
Ditto	JOHN COGH	
Private	JAMES HOLION	} Writing-case each
Ditto	JAMES McNICHOIL	
Ditto	GEORGE LOW	
Ditto	GEORGE ANDERSON	
Ditto	CHARLES SYMON	
Ditto	DAVID LINDSAY	
Ditto	SAMUEL COLLES	
Ditto	CHARLES H. CRONA	
Ditto	PETER COLLINGS	
Ditto	ROBERT DIXON	
Ditto	JAMES INKERTON	
Ditto	GEORGE JAMES	
Ditto	THOMAS JONES	
Ditto	ROBERT PARKER	
Ditto	MICHAEL PARK	
Ditto	WILLIAM H. REEVES	
Ditto	GEORGE STEWART	
Ditto	SETH SCOTLOW	
Ditto	JOHN SUMMERS	
Ditto	JOHN STEPHENS	
Ditto	JOHN BEATON	
Ditto	THOMAS BOOLER	
Ditto	ARTHUR GWIN	
Ditto	THOMAS HARVEY	
Ditto	JAMES OSBORN	
Ditto	SAMUEL ORR	
Ditto	WILLIAM THOMAS	
Ditto	NICHOLAS BOWERS	
Ditto	WALTER TRAVENAR	
Ditto	WILLIAM DICKENSON	
Ditto	JOHN WILSON	

Private	JOHN WYTHE	}	Writing-case each.
Ditto	JOHN STEWART ROWLEY		
Ditto	JOHN GOGAN		
Ditto	JOHN HENDERSON		
Ditto	WILLIAM BROWN		
Ditto	JOHN BANDEY		
Ditto	JOHN H. BILES		
Ditto	WILLIAM FROST		
Ditto	CHARLES HAYMAN		
Ditto	FREDERICK HAZARD		
Ditto	JOHN HENDERSON (2nd)		
Ditto	DAVID LLOYD		
Ditto	ROBERT LENNOX		
Ditto	EDWARD MITCHELL		
Ditto	JOHN MCGOWAN		
Ditto	WILLIAM PHILIPIN		
Ditto	RICHARD POTTER		
Ditto	WILLIAM THOMPSON		
Ditto	JOHN THOMPSON		
Ditto	WILLIAM H. TOWNSEND		
Ditto	JAMES THOMPSON		
Ditto	WILLIAM CROWDY		
Ditto	WILLIAM DOWLING		
Ditto	SAMUEL MORGAN		
Ditto	ALFAXANDER MCINTOSH		
Ditto	JAMES REYNOLDS		
Ditto	JOHN STICKLAND		
Bugler	JOHN WARNER	}	Pocket-compass.
Ditto	JOHN WAYCOTT		
Private	JOHN CUMMINGS		

5TH CLASS.

Presents value 10s. each.—No. 14.

Corporal	THOMAS PARKER	}	Case of instruments each.
Ditto	RICHARD P. JONES		
Ditto	JAMES B. WALKER		
Second-corporal	JOHN DONALDSON	}	Case of instruments each.
Private	CHARLES PERRY		
Ditto	EDWIN PROWSE		
Ditto	RICHARD DAVIS		
Ditto	WILLIAM HAWKINS		
Ditto	WILLIAM HOLLAND		
Ditto	JAMES RANSEY		
Ditto	JOHN WILLIAMSON		
Private	JOHN CAMERON	}	Writing-case.
Ditto	JOHN LANGFIELD		
Ditto	THOMAS RIDDLE		
		}	Penknife each.

The four last classes attended to the general duties of the exhibition, both during the preliminary arrangements and during the exhibition. Many were classmen; several were clerks and draftsmen; a detachment attended to the fire arrangements; a few to the ventilation and registration of the thermometers; one was a modeller and in charge of carpenters; and one or two were attached to the photographic department. See also year 1851 of

INCREASE.										DECREASE.										Year.
Year.	Strength.	Additions by			Total Strength.	Deaths.	Discharges.					Desertions.	Returns, and others required to be returned to their regiments.	Total Decrease.	Total Strength.	Wanting to complete.	Establishment. ¹			
		Recruits.	Transfers.	Joined from regiments.			By purchase.	By voluntary discharge.	Unmodified sickness, &c.	Limited service expired.	For mason duty.							Transported.		
1st Jan.																				
1831	1342	39	4	2	45	41	19	2	1	..	7	1	4	..	75	1312	34	1346	1831	
1832	1312	35	..	1	36	31	35	5	84	..	8	1	5	..	169	1179	5	1184	1832	
1833	1179	36	..	1	38	1217	60	2	24	..	..	1	2	..	115	1102 ²	..	1067	1833
1834	1102	12	3	..	15	1117	27	57	19	..	..	..	2	..	106	1011	56	1067	1834
1835	1011	65	1	..	66	1077	27	47	3	5	..	..	2	..	92	985	82	1067	1835
1836	985	90	2	..	92	1077	20	29	5	5	..	..	8	..	73	1004	63	1067	1836
1837	1004	91	2	1	94	1095	21	33	11	5	..	1	7	1	82	1016	29	1045	1837	
1838	1016	60	20	1	81	1097	21	22	5	7	..	3	4	3	69	1028	65	1093	1838	
1839	1028	166	5	3	175	1203	21	25	10	8	..	1	9	1	77	1126	71	1197	1839	
1840	1126	134	6	3	143	1269	25	37	19	..	7	1	10	2	100	1169	36	1205	1840	
1841	1169	204	4	5	213	1382	19	24	11	1	..	..	10	3	72	1310 ³	..	1295	1841
1842	1310	52	5	3	60	1370	20	31	10	..	..	..	13	..	74	1296 ⁴	..	1287	1842
1843	1296	68	3	6	77	1373	44	39	9	3	1	..	5	..	113	1260	27	1287	1843	
1844	1260	102	3	1	106	1366	27	42	5	4	..	..	2	2	86	1280	7	1287	1844
1845	1280	134	5	1	140	1420	16	48	20	11	2	..	7	2	109	1311 ⁵	..	1287	1845	
1846	1311	349	13	4	366	1677	21	56	25	..	4	..	15	1	122	1555	42	1597	1846	
1847	1555	358	22	15	391	1946	22	65	16	32	..	..	31	7	178	1768	29	1797	1847
1848	1768	333	37	10	380	2143	36	77	24	5	2	..	22	6	169	1979	203	2182	1848	
1849	1979	197	8	8	233	2212	50	73	18	2	1	..	19	1	170	2042	140	2182	1849	
1850	2042	129	6	8	143	2185	23	60	5	2	6	..	25	..	121	2064	118	2182	1850	
1851	2064	115	..	6	121	2185	28	26	15	1	..	7	23	..	101	2064	138	2182	1851	
1852	2084	100	7	12	119	2203	40	61	14	2	..	..	37	..	157	2046	136	2182	1852
1853	2046	189	22	14	225	2271	48	38	39	6	..	..	54	1	190	2081	572	2653	1853
1854	2046	189	22	14	225	2271	48	38	39	6	..	..	54	1	190	2081	572	2653	1854

¹ Officers not included. ² 35 excess. ³ 15 excess. ⁴ 9 excess. ⁵ 24 excess. No returns have been prepared since 31st March, 1854.

¹ Officers not included. ² 35 excess. ³ 15 excess. ⁴ 9 excess. ⁵ 24 excess. No returns have been prepared since 31st March, 1854.

APPENDIX X.

NAMES of MEN who have been KILLED or DROWNED while on DUTY or otherwise, by Accident, but not in Action, as far as the same can be now ascertained.

Date.	Rank.	Names.	Where.		Under what circumstances.
July 13, 1772	Private - Sergeant	John Dobbs . George Sherriff . Michael Gib . George Shearer . Robert Taylor . William Robertson . John Mair . William Scott . Andrew Lindsay . Edward Fryer . David Boney . Francis Hardie . William Cleghorn . Henry Lyall . William McLean . William Duguid . John Brown . George Henry . John Steedman . John Burns . Robert Garrow . Thomas Peacock . David Bain . John Stuppert . George Burn . John Napier . Charles Comb . Archibald Fullerton . William Muir .	Gibraltar	Killed .	Blown up whilst blasting rock.

Sept. 24, 1786	Recruits	Thomas Hastie. John Hutton . James Ore . Robert Young . John Brander . James Douglas . Henry Lawson . Thomas Moscrip Charles Ross . Gustavus Ross . James Tosh . Alexander Gray . George Duguid . John Macdonald Simon Fraser . William Ross . Timothy Clark . Charles Crosbe. Joseph Abdy . James Burnton. David Hunter . James Comb . Alexander Forbes James Burgoes . John Westwaters Alexander White . Andrew White . William Ramage . Daniel Thomson .	Near Dunkirk, on passage from Leith to Gibraltar	Perished	with all their lives and children, numbering 28 of the former, and 14 of the latter.
25 or 26 Sept.	Recruit .	Mardyck near Dunkirk	Perished	After gaining the shore from the 'Mercury,' from cold, wounds, and exhaustion.	
June 4, 1789	Private .	Francis Pearce	Plymouth	Killed .	In a riot.
June 26, "	Drummer	Thomas Mitchell	Chatham	Killed .	By a wooden pipe 16 feet long, falling from a pump on his head.
1791	Sergeant	John Fraser	Gibraltar, at Ragged Staff	Drowned	
Dec. 18, 1794	Private .	John Vernon	Woodwich	Drowned	

Names of Men who have been Killed or Drowned while on Duty or otherwise, &c.—continued.

Date.	Rank.	Names.	Where.	Under what circumstances.
Aug. 1797	Private.	Miles Ratcliff . . .	Barbadoes . . .	Drowned
	"	Alexander Wright . .	On passage from England to West Indies.	Drowned
Aug. 1, 1798	"	John Nancarrow . . .	On expedition to Surinam	Drowned
April 19, 1799	"	Philip Patterson . . .	On passage from England to Turkey.	Drowned
May 27, 1800	"	George Laken . . .	Off Turkey . . .	Drowned
Aug. 21, "	"	James Strang . . .	Chatham . . .	Drowned
Oct.	"	Walter Allen . . .	Halifax, Nova Scotia .	Drowned
June 2, 1801	"	John Rogers . . .	River Nile, near Rahmanieh, Egypt.	Drowned
Aug. 15, "	"	John Bain . . .	From St. Thomas to Martinique.	Drowned
April 4, 1804	"	Daniel Brown . . .	Jersey . . .	Killed .
Feb. 1805	"	John Marley . . .	From England to Gibraltar	Drowned
June 22, "	"	James Dane . . .	Spike Island . . .	Drowned
Jan. 9, 1808	"	Thomas Mitchelson . .	Gibraltar . . .	Killed .
Jan. 26, "	"	Charles Cranham . . .	Gibraltar . . .	Killed .
Sept. 15, 1809	"	George Spratt . . .	Merida, Spain . . .	Killed .
Oct. 7, "	"	Thomas Lane . . .	Madeira . . .	Killed .
Mar. 21, 1810	"	Thomas Hughes . . .	Tarifa, near to . . .	Killed .
June 16, "	"	John Screech . . .	Newfoundland, Signal Hill	Killed .
Oct. 22, "	"	William Cock . . .	Newfoundland . . .	Drowned
Dec. 3, "	"	Benjamin Hall . . .	Puntales, Cadiz . . .	Killed .
May 26, 1811	Corporal	James Roope . . .	Newfoundland . . .	Killed .
Oct. 4, "	"	William Brown . . .	Cadiz, near Isla de Leon	Murdered

Supposed by a private of the corps, who was tried, but excused for want of

Nov. 28, 1813	Paul Harvey	Tarifa	Killed	By being carried down the main drain during a storm, into the sea.
April 21, 1813	William Liddle	Gibraltar	Drowned	By the springing of a mine.
June 21, "	William Dunstan	Gibraltar	Killed	By losing his way in a dense fog, and falling into the King's End Docks.
July 6, "	James Ashcroft	Woolwich	Drowned	
Dec. 27, "	Patrick O'Brien	Dublin	Drowned	
Dec. 31, "	Edward Mooney	Nive, near Ustaritz	Drowned	
Nov. 22, "	Michael Fitzgerald	From England to Peninsula York, Canada	Burned to death	By the conflagration of the barracks.
Jan. 1, 1814	James Duffy			
Jan. 14, "	George Munrean	Falmouth	Perished	In the wreck of the 'Queen Charlotte.'
Jan. 14, "	James McFarney	Falmouth	Perished	Fell overboard.
Jan. 28, "	John Stewart	From Plymouth to Portsmouth	Drowned	In the foundering of a chasse-maree in crossing the dangerous bar of the river.
Feb. 24, "	John McNight	Adour, near Bayonne	Perished	Whilst bathing.
Feb. 24, "	Patrick Power	Adour, near Bayonne	Perished	Was benighted, and falling from exhaustion in the snow, was smothered, and thus died. He was discovered by a Newfoundland dog.
Sept. 18, "	John Benoy	Chatham. St. Mary's Creek	Drowned	
Feb. 19, 1815	Daniel Dougherty	Newfoundland	Frozen to death	
March 6, "	Edward Miah	Off Dauphine Island, Amer.	Drowned	
April 7, "	Robert Hoston	Bermuda	Drowned	He was pursued by a party sent in quest of him, and jumping into the Great Pond at Signal Hill to effect his escape, was lost in the attempt.
July 13, "	Thomas Williams	Newfoundland	Drowned	By falling off the bridge on arousing from sleep.
July 20, "	James White	Seine, near Paris	Drowned	By falling from a window, supposed in a state of somnambulism.
July 31, "	David Morgan	St. Denis, France	Killed	By private David Smith of the corps, who was executed 12 Dec., 1815.
Nov. 1, "	William Ritchie	Epinay, France	Murdered	By a stone of 2 tons weight falling on him in a quarry when mining.
May 1, 1816	Morgan Williams	Plymouth	Killed	
Aug. 8, "	James Miller	Gibraltar	Drowned	

Names of Men who have been Killed or Drowned while on Duty or otherwise, &c.—*continued*.

Date.	Rank.	Names.	Where.	Under what circumstances.
Dec. 24, 1817	Private.	Walker White . . .	St. Amand, France . .	Lost his way and fell into the canal.
June 22, "	"	John Tretheway . .	Chatham	Whilst bathing.
Aug. 16, "	"	James Verner . . .	Barbadoes	By the explosion of a mine.
June 19, 1818	"	Alexander Milne . .	Rheims, France . . .	Perpetrators were never discovered.
Oct. 22, "	"	James Scott	France	
Jan. 11, 1819	"	William Liddle . . .	Kingston, Upper Canada	While endeavouring to cross the ice on Lake Ontario.
Jan. 19, 1821	"	Garnet Ashton . . .	Corfu	By falling from a scaffold.
Jan. 11, 1822	"	Walter Urie	Chatham	By falling into the ditch of the fortifications.
April 1, "	"	Michael Connolly . .	At sea, on board H.M.S. 'Salisbury.'	By falling down the hatchway.
Sept. 8, "	Corporal	Michael Harle . . .	From Gibraltar to England	By a fall. He had given orders to fire a mine, and was springing by means of a rope across a chasm, to take cover from the explosion behind a bold rock, when the rope was cut through by a projecting ledge, and falling many hundred feet down the eastern precipice, he was dashed to pieces.
April 5, 1823	Private.	James Blake	Bermuda	
Nov. 14, "	Corporal	William Williams . .	Gibraltar	
July 29, 1824	Private.	James Ross	Chatham	Fell overboard from a pontoon raft.
Sept. 26, 1825	"	William Berry . . .	Chatham	Fell overboard from a pontoon raft.
Dec. 23, "	"	William Widders . .	Bermuda	Whilst blasting rock.
July 14, 1826	"	David Marshall . .	Corfu	
March 17, 1827	"	Richard Rosevere . .	Bermuda	By being blown up when blasting rock.
July 24, "	"	Andrew Mathieson . .	Chatham	Whilst bathing.
Sept. 3, "	"	Henry Bennett . . .	Gibraltar	By falling from the rock when at work.
Dec. 1, "	"	James Masters . . .	Rideau Canal, Canada .	By being blown up whilst blasting rock.
Feb. 16, 1829	"	Walter Sim	At sea, on passage to Ber-	

July 13, 1829	Private.	JOHN WILLIAMS	CHATHAM	By blasting in a quarry.
Aug. 24, "	"	Thomas Duffy . . .	Rideau Canal, Canada . . .	By being blown up in a quarry.
May 29, 1830	"	James Simmons . . .	Rideau Canal, Canada . . .	By a stone falling on him on the works.
June 18, "	"	John Kerr . . .	Halifax, Nova Scotia . . .	By the explosion of a box of gunpowder when blasting rock.
July 6, "	"	Alexander McMicken . . .	Bermuda . . .	By being blown up in a quarry.
Jan. 28, 1831	"	Leonard Jasper . . .	Rideau Canal, Canada . . .	By an explosion in the canal.
March 9, "	"	John Higford . . .	Rideau Canal, Canada . . .	By the falling of large pieces of rock upon them, which crushed them to death.
May 31, "	"	Gumple Nathan . . .	Gibraltar . . .	By the falling of the hospital during a hurricane, which crushed him to death.
" "	"	William Street . . .	Gibraltar . . .	
Aug. 11, "	"	Charles Shambrook . . .	Barbadoes . . .	
Nov. 10, "	"	William Gunn . . .	Rideau Canal, Canada . . .	By falling over the works at Fort George.
July, 22, 1832	"	Nathaniel Fulcher . . .	Halifax, Nova Scotia . . .	By the upsetting of a boat while surveying the islands in the Lough.
Nov. 6, 1834	"	John Strachan . . .	Bermuda, Morris' Island . . .	By the explosion of a box of gunpowder when blasting rock.
Feb. 6, 1835	"	James Bennie . . .	Lough Strangford, Ireland . . .	By the upsetting of the 'Tigris' steamer, during a hurricane.
Feb. 22, 1836	"	Matthew Rosevere . . .	Bermuda . . .	By a fall from a car.
May, 21, "	"	Archibald McDonald . . .	River Euphrates . . .	With his wife and four children in the wreck of the barque 'Doncaster.'
July 3, "	"	John Crossett . . .	Leixlip to Chapelizod . . .	By a fall.
July 17, "	Corporal	John Reid . . .	L'Agnihass Reef, 70 miles S.E. Cape of Good Hope.	Whilst bathing.
Mar. 8, 1837	Private.	John Porteous . . .	Passages, Spain . . .	In a diving apparatus, while employed at the demolition of the brig 'William.'
July 19, "	"	Robert Steele . . .	Chatham . . .	By an explosion in blasting rock.
May 21, 1838	2nd Corp.	Henry Mitchell . . .	Off Tilbury Fort . . .	By being washed from a rock into the sea, whilst endeavouring to recover his note-book. He was surveying Valencia Island.
Mar. 31, 1840	Private.	Thomas Bonds . . .	Bermuda . . .	
Dec. 10, "	"	Joseph Maxwell . . .	Coast of Kerry . . .	
April 24, 1842	"	Edward Lowe . . .	Kat River, Cape of Good Hope.	In endeavouring to recover a wounded duck. When found he was entangled in the reeds at the bottom of the lagoon, with the duck clenched in his fist.
Oct. 15, "	2nd Corp.	William Finlay . . .	Moorunda, River Murray, South Australia.	

Names of Men who have been Killed or Drowned while on Duty or otherwise, &c.—continued.

Date	Rank	Names	Where	Under what circumstances
April 27, 1844	Private.	John Skelton . . .	Spithead . . .	By falling over the gunwale of a boat, during a lurch in a swell of the sea.
July 30, "	"	Daniel Martin . . .	St. Roque, Spain . . .	In a quarrel, by a Spaniard striking him on the head with a chair.
Oct. 22, "	"	George Shanks . . .	Bermuda . . .	Whilst trying to swim from the sloop 'Annawan' in Grassy Bay to the shore.
May 16, 1845	2nd Corpl.	Thomas Bone . . .	Bermuda . . .	(By the boat in which they were crossing the little sound near Hunt's Bay, striking against a sunken rock and foundering.
"	Private.	Peter Marshall . . .	Bermuda . . .	
June 12, "	"	William W. Riddle . . .	Chatham, St. Mary's Creek	Whilst bathing
July 11, "	"	John Humill . . .	Bermuda . . .	By falling down a steep bank.
Nov. 26, "	"	John Trevelin . . .	Hong Kong, China . . .	Whilst bathing.
June 16, 1846	"	Thomas Kilbride . . .	River Ouse, York . . .	Fell overboard from the 'Athol,' during one of the heavy lurches of the vessel.
Dec. 14, "	"	Joseph Rawlings . . .	Near Bermuda . . .	On the tide receding, he was found not far from the shore, in a hole. He is supposed to have missed his way, and fallen into the river.
Jan. 2, 1848	"	Hugh Arnold . . .	Kowie River, Cape of Good Hope.	Whilst bathing.
June 25, "	"	Thomas Hudson . . .	Red River, Hudson's Bay	Fell overboard.
Aug. 3, "	"	William Miller . . .	Hong Kong to Macao . . .	Fell from a raft whilst pontooning.
April 26, 1849	Sergeant	Joseph Cox . . .	Chatham . . .	
June 19, "	Corporal	John Sutton . . .		
"	Bagler	Bartholomew Griffiths . . .		
"	Private.	William Henderson . . .		
"	"	David John . . .		
"	"	Joseph McLachlan . . .		
"	"	Robert Martin . . .		
"	"	James Scott . . .		
"	"	Charles Quigley . . .		
"	"	James Baker . . .		

"	"	Maldon Nicholson . . .	Prince Edward's Island, 12° south of the Cape of Good Hope, on passage to New Zea- land.		In the wreck of the 'Richard Dart,' freight-ship, with their wives and children, numbering four of the former and nine of the latter.
"	"	Samuel Pinch . . .		Perished	
"	"	Alexander Clark . . .			
"	"	William C. Green . . .			
"	"	John Mulreany . . .			
"	"	Robert Alexander . . .			
"	"	Nathaniel Vicary . . .			
"	"	Sammel Peters . . .			
"	"	Paul Orchard . . .			
"	"	Richard Holt . . .			
"	"	Robert Bruce . . .			
"	"	James Ferguson . . .			
"	"	William Thomas . . .			
"	"	William Mitchell . . .			
"	"	William Goldsmith . . .			
"	"	Aug. 24,			
"	"	Sept. 4,	Prince Edward's Island, 12° S. of the Cape. Port Brown, Cape of Good Hope.	Perished	From frostbite, exposure, and ex- haustion.
"	"	Oct. 10,		Killed .	By a wagon running over him.
"	"	Oct. 28,	Sandhurst	Killed .	{ By an explosion of gunpowder, whilst employed in blowing up an ex- perimental stockade.
"	"	Mar. 30, 1850	Sandhurst	Killed .	{ By missing his way in the dark and falling into the sea.
"	"	Sept. 6, 1851	Bermuda	Drowned	By the upsetting of a boat.
"	"	Aug. 9, 1852	Bicester, near Oxford . . .	Killed .	By the upsetting of a railway train.
"	"	Oct. 31,	Keskama Hock, Cape of Good Hope.	Killed .	By an explosion when blasting rock.
"	"	Nov. 9,	Keyhaven, nr Hurst Castle Malta	Drowned Killed .	By falling from a wall 36 feet high, on the works.
"	"	Dec. 27,	Corfu	Killed .	By a blow in the face from a comrade, who was tried for the offence, and sen- tenced to six months' imprisonment.
"	"	May 27, 1853	River Swale, near Rich- mond, in Yorkshire.	Drowned	Whilst bathing.

Names of Men who have been Killed or Drowned while on Duty or otherwise, &c.—continued.

Date.	Rank.	Names.	Where.		Under what circumstances.
May 14, 1853	Private.	Alfred Hawkins	{ In a lake on the north shore, about 6 miles from Auckland, New Zealand. }	Drowned	{ In a heavy gale of wind, by the swamp- ing of a boat of peculiar construction, known as a "twin-boat," consisting of two bottoms united by one deck, while out with Lieut. C.T. Hutchinson, R.E., who also perished. The officer had been taking sketches of the shore. By falling into Barrack-hill quarry. Whilst bathing. From exhaustion and the inclemency of the weather. After a fatiguing day's work he lay down to rest by the side of a mountain stream, and died. Was shot through the heart by private William Sims, of the corps.
" "	" "	Samuel Parsons		Drowned	
Mar. 11, 1854	" "	Henry Clark		Killed	
June 7, "	Recruit.	John Bell	Bermuda	Drowned	{ During a storm in the wreck of the screw steamer 'Princee.'
June 10, "	Private.	Richard Pemble	Bangor	Perished	
			Elvanfoot, Lanarkshire .	Perished	
June 29, "	" "	Richard Wilkinson	Halifax, Nova Scotia. .	Murdered	{ During a storm in the wreck of the 'Rip Van Winkle.' By falling out of a boat while sitting on the gunwale. Found frozen to death in the snow.
Nov. 14, "	Sergeant	William Carne.	{ Outer Harbour of Bala- klava, Crimea . . . }	Perished	
" "	Private.	Samuel Lewis		Perished	
" "	" "	Thomas Price		Perished	
" "	" "	Thomas Toohy	{ Outer Harbour of Bala- klava, Crimea . . . }	Drowned	{ Whilst bathing. Fell overboard from the 'Wanderer.' schooner, during a heavy lurch of the vessel. Went to fish. Was subject to flu, and it is supposed that being seized with one, he fell into the stream. His body was found at Kalso, upwards of forty miles from the spot where he perished.
" "	Corporal	John Pendered		Perished	
" "	Private.	John Hammond		Drowned	
Nov. 19, "	" "	Donald McKenzie.	Belfast Lough, off Bangor	Perished	{ Whilst bathing. Fell overboard from the 'Wanderer.' schooner, during a heavy lurch of the vessel. Went to fish. Was subject to flu, and it is supposed that being seized with one, he fell into the stream. His body was found at Kalso, upwards of forty miles from the spot where he perished.
Jan. 4, 1855	" "	James Deacon	Near the camp in front of Sebastopol . . .	Drowned	
Feb. 23, "	" "	Daniel Law	St. George's, Bermuda .	Drowned	
Feb. 23, 1856	Corporal	John Rowse	On passage from Natal to Cape Town	Drowned	{ Whilst bathing. Fell overboard from the 'Wanderer.' schooner, during a heavy lurch of the vessel. Went to fish. Was subject to flu, and it is supposed that being seized with one, he fell into the stream. His body was found at Kalso, upwards of forty miles from the spot where he perished.
Aug. 11, "	Private.	Michael McGreevy	River Tweed. Inver- leithin	Drowned	

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